

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## On Roasting Iron Ores.\*

BY N. LILIENBERG.

The Austrian iron industry having to labor under unusual difficulties, its careful economy in smelting carbonates is well worthy of notice. Without entering upon a general review of this subject, I ask attention to the most common of their calcining kilns, constructed by M. Fillafer, manager at Fridau, (Fig. 2, p. 3). It is composed of two ranges of rectangular chambers, *a a*, into which the ore is filled from the open tops. After charging, the doors at *b b* are shut, thus making the draft effective. The gas enters through the main flues *c c*, rises into *d d* and discharges through a number of small openings, built so as not to be filled with dust, and to clean themselves. The space across the chamber, between the gas jets, is no greater than necessary to effect the burning all through; as no crude center is left, it is not necessary to pick out any raw lumps afterward. Below the gas jets are grates, by which the descent of ore can be regulated

pelled, a part of the latter is absorbed by the burnt lime, and remains there during the succeeding operation. The burnt calcareous ores cannot, of course, be washed, and have, on the contrary, to be sheltered from rain, a matter omitted in many places. The siliceous ores require a longer exposure to vigorous oxidizing, for transforming the protoxide of iron combined with the silica into peroxide, and the sulphide into sulphate, before the final application of bright red heat without danger of melting.

The great height of the Westman kiln is especially adapted for a careful preparation of the ore before exposure to the final heat. But the air for oxidizing contains a large amount of carbonic acid, sometimes carbonic oxide, and, besides, all the sulphurous gases. The heat rises chiefly along the walls, one part being absorbed by the brickwork, and the other part by the ore, which is thus roasted to a certain depth. In the interior, however, a mass of crude ore is left untouched by the gases, and, therefore, raw lumps occasionally come out with the roasted ores, to be picked out and roasted anew.

kiln in a state just suitable for a washing process. The same result ought to be obtained by conducting steam just below the flame, before the admission of pure air, as this, to a certain extent, replaces the operation of driving out the sulphuric acid. By single roasting, in a Taylor kiln, there will probably be little sulphur and much sulphuric acid in the product. The gas in this kiln is very early mixed with air, so as to render impossible the escape of unburnt carbonic oxide. By its running from the center, there is a better utilization of heat than in the Westman kiln, the absorption throughout the walls being less. The gas being generated in a special producer, there is sufficient pressure in the pipe for using the injector system. But in the case of waste gases from a blast furnace, especially where the top is open, as with most of the Swedish ones, there would probably be too low a pressure for using this system. In that case, it would also be necessary to close the top of the kiln, to prevent air being drawn in directly that way, and to increase the height of the chimney, thus assisting the

below the projections *c c*, in a similar way as in the Taylor kiln, thus doing away with the many small openings in the Fillafer furnace. In front of the hot region are three doors, similar to the Westman system, through which the ore can be worked. The middle part of the shaft is composed of double-brick walls, the inner part being as thin as can be made consistent with the resistance against pressure and wear of the ore. These walls are composed of rectangular perforated bricks, *f f*, giving admission of pure air to the ore, and, at the same time, making the combination of the thin walls sufficiently strong for resisting the pressure of the ore. The inner walls overhang on the short sides by resting on projections, or, in case it should prove necessary, on iron tanks with circulating water. The chambers communicate, through the branch flues *g g* with the main flue *h*. In the upper part the gas is thrown out, through the openings *k k*, into the main flue. The openings are regulated by registers. The air to the outer chambers, surrounding the shafts, is admitted through the doors *b b*. It will now

horizontal rails, connected through the brickwork by eye-bars. The frames containing the door openings are kept in between the rails. Along the sides are two floors for working and regulating. The top openings are closed by covers sliding between the rails. The cars containing the ore are elevated on a pair of platforms, *p p*, hanging on a wire rope over a wheel, *q*. Under the platforms are water tanks, filled alternately from above by opening the valves of a water pipe, and emptied below when the bottom valves strike the bottoms of the discharge channels. The movement is regulated by a brake on the wheel. Unless local circumstances prevent it, it may, in most cases, be possible to use the same hoist for the blast furnaces and the calcining kiln described, by extending a bridge between them and placing the bottom of the blast furnaces so much lower.

Prof. Emerson Reynolds describes a process for the protection of lead against corrosion which is done by coating it with a film of sulphide of lead. He recommends the fol-

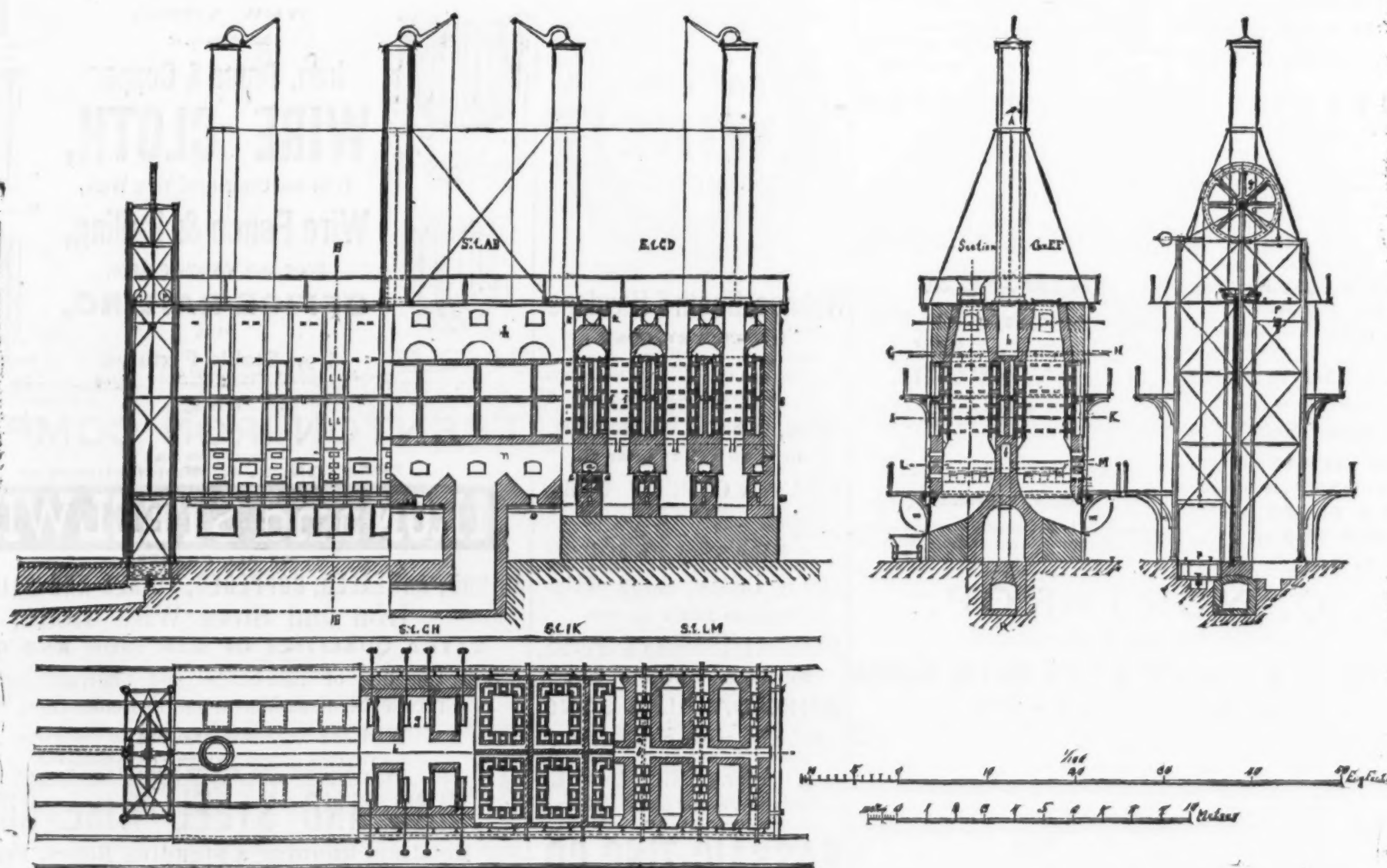


Fig. 1.

LILIENBERG'S CALCINING KILN FOR IRON ORE.

better than by discharging alone. In many places, however, these grates have proved troublesome, and are omitted. The air for combustion enters through the discharge doors. The capacity of roasting is about 11 cubic feet of space per ton of ore roasted in 24 hours. A new charge is not put in before the top is red hot. It ought to be remembered that these kilns are exclusively used for carbonates, and would not, in this shape, prove successful for desulphurizing. Fine ore cannot be roasted in this way, it being impossible to let the gases penetrate the dense mass, but for effecting this kind of roasting, M. Moser, in Austria, has invented a reverberatory furnace, with inclined bottom, on which the ore slides down, in a direction opposite the course of the flame.

Among the constructions of calcining kilns for desulphurizing, those of E. Westman, in Sweden, and W. J. Taylor, in America, ought to be specially noticed. The general features of the former, as used at nearly all of the Swedish blast furnaces, are well known. Calcareous ores ought to be treated differently from the siliceous ores; this is to a certain extent observed in Sweden. The former require, of course, as much more heat as that absorbed by the carbonic acid on leaving the limestone. The final heat may also in that case be higher, without danger of melting. As the carbonic is driven out in parts of the kiln above those in which the sulphuric acid is in ordinary cases ex-

The only satisfactory results in the Westman kiln can be obtained by roasting two or three times, care being taken that the ores once roasted are not mixed with crude ores, as it requires greater heat for driving out the last sulphuric acid from the basic sulphate.

In the Taylor kiln, the preheating chamber is very small, the ore being attacked by a vigorous flame near the top. The main part of the air for oxidizing is admitted below the flame, and without being mixed with any gases of combustion, acts upon the ore. According to the above remarks, half of the sulphur in the pyrites is driven out at a much lower heat than the sulphuric acid. The oxidizing region should therefore be placed between these two places, for transforming the sulphide into sulphate, and the protoxide into peroxide. This space is very short in the Taylor kiln, and is filled with gases of combustion to about the same extent as in the Westman kiln. It is therefore probable that, by this sudden exposure to high heat, the sulphide ( $\text{FeS}$ ) melts, and then it naturally requires those large oxidizing chambers, with the pure air, for converting it into sulphate. At the lower end of the chambers there is, consequently, formed a great amount of the ferric sulphate. But there the operation ends. The bright red heat for driving out the last sulphuric acid is never applied. As the ore has not, after the oxidizing, been exposed to the heat for forming the basic sulphate, it is probable that the siliceous ores leave the Taylor

feeble pressure from below. The roasting process in the Taylor kiln is mainly regulated by the discharge from below, whereas the Westman kiln has several other means. The former has, however, the advantage of doing away with the crude center, roasting the ore all through.

Both systems suffer from the difficulty of equally distributing the ore through a small opening over a large surface. When a large amount and variety of ores must be roasted at the same time, the circular roasting kiln are too limited, comparatively expensive in construction, and embarrassing in changing ores. It will be clearly seen that these difficulties are less troublesome in the Fillafer furnace, the plant of rectangular chambers allowing an unlimited extension and the simultaneous roasting of several different ores. But the construction used in Austria for carbonates is unsuitable for desulphurizing.

I have tried to work out the necessary changes for this purpose, and call attention to the roasting kiln represented by Fig. 1, which would, in my opinion, meet most of the requirements. The calcining kiln contains two sets of rectangular chambers. In the lower part of these the gas is introduced through the branches *a a*, extending from the main flue *b*. Air for combustion is taken in through the inclined openings *c c* from the channels *d d*, the admission being regulated by the outer doors. Thus the mixing of air and gas is effected before they touch the ore. The flame extends

be understood that the burnt gases are partly thrown out the easier way through the overhanging chambers on the short sides, thus causing the flame to turn round. The thin walls are thereby heated and communicate part of their heat to the ore in a way similar to that adopted in some coking furnaces. The air becomes heated by circulating around the walls and running through the perforated bricks. It is thrown in by action from the upper openings *k k*, because it is a shorter distance, and the mechanical resistance from the ore consequently less than the flame passing all the way from below. By merely moving the valves for the openings at *g* and *k*, it will thus be possible to throw off more or less of the impure gases from the ore, and to give admission of pure hot air. The first half part of the sulphur is thus volatilized in the upper region and eliminated. The second part is oxidized within the thin walls, and, finally, the sulphuric acid driven out by the direct flame. It is easy to introduce steam through the doors in case of need, thus mixing water with the pure air admitted on the ore. The ore is discharged below through the hanging doors *m m*. The gas enters through the main flue *n*, and is distributed on both sides. The bottom of this flue is arranged so that the dust can accumulate and can be drawn out through the doors *o o*. On the chimney flue are erected four stacks, made of iron plate, lined with red brick. The binders are made of vertical rails kept in by three lines of hor-

lowing method: Take 16 grams of solid caustic soda, dissolve it in 1.75 liters of water, and add to the liquid 17 grams of nitrate of lead, or an equivalent of other lead salt, with 250 cubic centimeters of water; raise the temperature of the mixture to  $90^{\circ}\text{C}$ . If sufficient lead salt has been added, the liquid will remain somewhat turbid after heating, and must then be rapidly strained or filtered through asbestos, glass-wool, or other suitable material, into a convenient vessel. The filtered liquid is then well mixed with two cubic centimeters of hot water, containing in solution 4 grams of sulpho-urea or thio-carbamide. If the temperature of the mixture be maintained at about  $70^{\circ}\text{C}$ , deposition of sulphide of lead or galena, in the form of a fine adherent film or layer, quickly takes place on any object immersed in or covered with the liquid, provided the object be in a perfectly clean condition and suitable for the purpose. When the operation is properly conducted, a layer of galena is obtained which is so strongly adherent that it can be easily polished by means of the usual leather polisher. It is not necessary to deposit the galena from hot liquids, but the deposition is more rapid than from cold solutions.

The Railway Review has a paper by S. W. Robinson, C. E., Professor of Mechanical Engineering in the Ohio State University, on a new rail, which he describes as the improved Concave Railway Rail. This is somewhat similar to the old U rail; but the con-

\*From the Journal of the United States Association of Charcoal Iron Workers.



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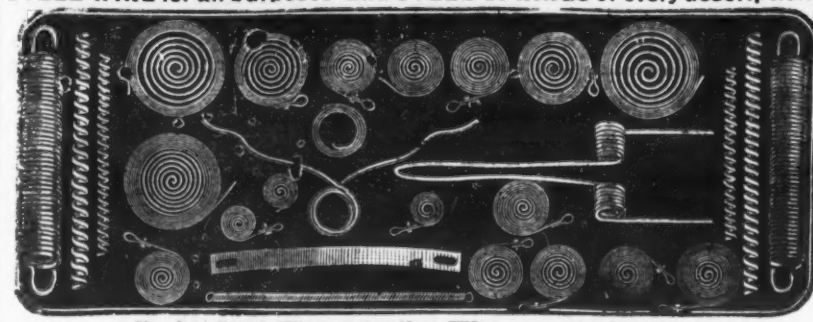




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cave space is filled with wood, and the head (which is much thicker than that of the U rail) is said to be more than usually compressed and solidified. The rail is fixed by dog spikes, while the end fastenings are made by an iron plate fitted inside the rail, requiring no fish bolts or nuts. It is stated that this rail has already been tested on the Chicago and Western Michigan Railway with excellent results, although the ordinary 56-pound steel rails were replaced by 45-pound iron concave rails.

### The Manufacture of Russia Sheet Iron.

BY H. B. FROM.

So many different versions were current as to the process adopted for producing the sheet iron known as Siberian, polished and unpolished, I determined when in the Ural to remain, if possible, at some one or more of the works, and watch the production from the ore to the finished sheets. The manager, Ivan Ivanovitch Wohlsted, of the celebrated Demidoff works, obligingly offered me every facility, and in the report which follows the method followed there is explained; where from observation in other works, any difference of procedure of a serious nature was noted, I mark it, but the general conclusion I came to is that the manufacture of sheet iron is carried on with great care, great labor and expense, and that having good ore to commence with, the result is not difficult to obtain.

From the commencement to the end of the manufacture of the sheets I saw completed,

are at once cut into pieces 29½ and 30½ inches long, each piece representing a future sheet, and being of various thicknesses for sheets of diverse weights.

Sheet iron in Russia is invariably made 4 feet 8 inches by 2 feet 4 inches (2 arshines long, 1 arshine wide), and called 7 pound, 8 pound, 12 pound or 15 pound, being made of all weights from 6 pounds to 20 pounds per sheet. Hence the thickness of the puddled bars is not much considered. The puddle bars when broken show a fine granular fracture, somewhat steely, little, if any, fiber being found in the bars. About 60 of these pieces are taken—29½ inches for ordinary sheets and 30½ inches for polished or "glanced" sheets—and put into an ordinary furnace heated with wood from below, the bars being placed on ridges in the upper chamber, the flame impinging through three openings on either side. The rolling down of these bars into sheets is a matter of three processes. First, each slab is rolled out into a plate as near as possible—workmen being guided by the eye—2 feet 6 inches by 2 feet 8 inches. Six men are engaged in this process. One man screws down the rolls to a fixed standard of thickness. There are two rollers; one man draws the slabs and the other carries to the rolls. While these are rolling the slabs down, a sorter selects them in lots of three, putting a smaller one between two larger ones, and they are thus in lots of three returned to the furnace. Secondly, these "threes," not tied together in any way, but simply assorted, again at a fair heat, are drawn out and brought to the rolls, held open by the roller, and a boy throws between the plates prepared powdered charcoal; the bundles are then passed

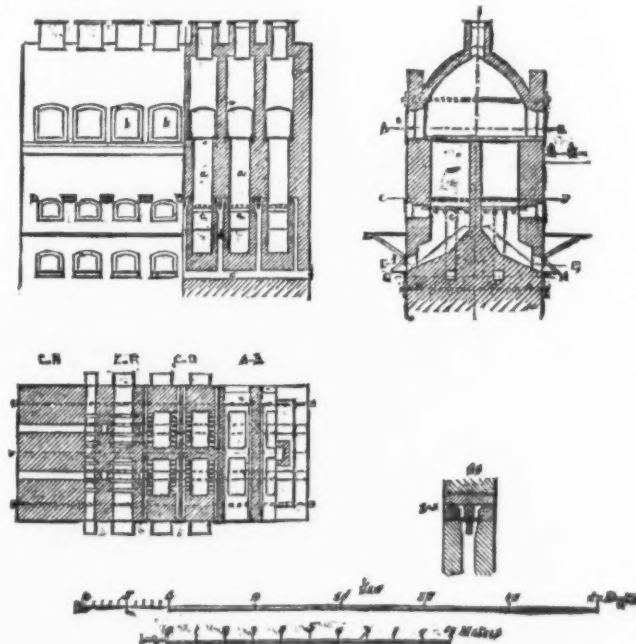


Fig. 2.

THE FILLAVER CALCINING KILN.

I did not lose sight of the same, except they were under care; so that, as the manager said, there might be no uncertainty or quibble. The ore from which the metal is made is obtained close to the blast furnaces of the celebrated Tagil works, from which the C C N D bars are produced. This ore is very rich, and under arrangements is also used in other works, such as Takovleff, &c., the family of the original owner, Mr. Demidoff, of that district, having by marriage and sales given over right to others to mine there. The ore scarcely contains a trace of phosphorus, and not any trace of sulphur. The analysis is as follows:

Si O <sub>2</sub> .....	7.87%	Mn <sup>2</sup> O <sub>3</sub> .....	0.57%
Al <sup>2</sup> O <sub>3</sub> .....	3.57%	Ca O .....	0.97%
Fe <sup>2</sup> O <sub>3</sub> .....	80.04%	S .....	0.01%
Mn .....	0.04%	Ph .....	0.25%

The flux used is ordinary limestone, found on the spot. Before being placed in the furnace the ore is roasted in heaps, of from 10,000 to 15,000 tons, with charcoal made from white pine. If the iron is for sheets, the workmen will not use charcoal made from birch wood. The roasting is done close at hand, quite in the open, and at any time of the year, the intense frost or heat not making any difference. In some works they prefer to roast the ore in the winter, and say red pine charcoal is not worse than white pine. The workmen assert that if charcoal made from birch wood is used, particularly in the blast furnace, then white specks are seen on the sheets. The managers say this is prejudice. The blast furnaces are oval. The size adopted as a standard has a capacity of 9000 cubic feet; the oval is 20 feet by 10 feet, being 52 feet high. The bottom is 3 feet diameter, and at 9 feet from bottom is full size of the oval. The system is Raschette's, with six tuyeres on each side, using hot blast at 200° Celsius. The furnace is charged every half hour with a thin layer of roasted ore and charcoal ore, broken up small and mixed with the flux; pieces of ore larger than a good-sized walnut are not passed. The blast for three such furnaces is provided by three horizontal engines, each having 29-inch steam cylinder and 5-foot stroke. The production is from 1500 to 2000 pounds per day, 25 to 30 tons. New charcoal produces more than old, but the production varies little. The pig iron produced is at once puddled in an ordinary puddling furnace. The workmen attach importance to its being at once puddled, and make it into blooms of 100 to 200 pounds weight. The puddling may be done with gas; it seems not to matter. Great care is taken to hammer the blooms well, to get rid of all impurities, under either a steam hammer or tilt hammer. Many workmen contend that the steam hammer is not so good as the tilt, but it seems simply prejudice. The blooms are at once reduced in a regular way into bars 5 inches wide, but of various thicknesses. After the bar has got rather cool the workmen stop rolling. These bars

through the rolls, the rolls being screwed down to the same point as before, the thickness of the three being reduced to the same as each was previously. Now the sorter again divides the sheets into lots by thickness, and makes bundles—not tied bundles—of three of the thicker, four of the medium and five of the thinner, and returns them to the same furnace. Thirdly, when the bundle is again at a good heat—red cherry—these lots of plates are brought to the rolls, opened out, and charcoal again powdered all over them, and the lots are passed through the rolls until the thickness of the lot is brought to the standard of the original one slab. The sheets are now all sheared to one length—5 feet; in the width they are not touched. The sheets are now ready for the finishing process. Before proceeding to this, let me describe the preparation of the charcoal, a matter to which the workmen attach much importance, but which the managers do not seem to consider of any moment.

The workmen object to birch wood charcoal, and prefer yellow pine and large-sized charcoal. It is first carefully washed to get out all earthy matter, ground in a mortar mill, or pounded under a hammer, washed again and dried, again powdered and sifted through a fine sieve. The workmen attach the greatest importance to using charcoal; but I saw sheets prepared without, which seemed quite as good, but the workmen contend that the sheets without charcoal soon lose the "bloom," or fresh look, especially with unpolished sheets. The sheets from the third process are stacked to cool completely—the lots I had in hand were allowed to stand in a rack from evening to morning—and are then assorted, as near as possible by the eye, into sheets of equal weight; seventy or eighty being considered a "pair" or lot for the future processes. Each sheet, being examined and brushed, is then dipped into a tank of water—the tank is never cleaned out, but kept full—"older the water the better"—and kept at about blood heat. Taken out of the bath, each plate is powdered all over with the prepared charcoal, dusted from or through a coarse linen bag. If the powdering is not done "equally" the color of the sheets will not be equal. The sheets being thus prepared, on the top and bottom of the bundle are placed two or three old plates to protect the sheets. The bundles of sheets being placed in the furnace, are very gradually heated, the workmen considering that the more smoke there is in the heating of the bundles the better the sheets will be; but to get the bundles to a bright red heat, not less than seven or eight hours should be employed. The bundles I had in hand were dipped, powdered and prepared by 3 o'clock, and were in the furnace till 10:30—the same furnace as before described, but that on and around the bundle, wood was placed to prevent direct action of the flames and produce smoke. When the packet was removed from the furnace, at

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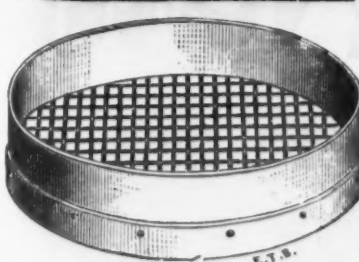
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kegs of unfinished shoes.

**Overhead Heating.**  
The system of overhead heating in manu-  
factories and mills by means of steam pipes  
is being very generally adopted in New Eng-  
land, and is recommended by the insurance  
companies. The first objection usually made  
is that heat rises, but, in point of fact, the  
connection of heat from pipes is by radia-  
tion, and does not follow special direction  
either upward or downward under the usual  
conditions of a factory. It is simply a ques-  
tion of diffusion, and the best place for the  
pipe is where the radiation or diffusion is  
effected in the best manner. One of the  
greatest dangers to which factory buildings  
are exposed, and one of the heaviest causes  
of loss, is the collection of combustible mat-  
ter on steam pipes, where they are ordi-  
narily placed at the sides of the room under  
the windows. Mr. Edward Atkinson, presi-  
dent of the Boston Manufacturers' Mutual  
Fire Insurance Company, recently addressed  
a circular to the managers of 52 mills  
where this system is employed, asking a  
number of questions to draw from them the  
results of their experience with overhead  
pipes, and received 42 answers. Out of the  
42 replies two were unfavorable; two were  
unfavorable, but were qualified by state-  
ments that showed their apparatus to be  
poor; one was favorable with exceptions,  
and 37 were absolutely favorable. In respect  
to economy in heating the answers varied  
from nothing to 25 per cent. saved, and the  
greatest saving was shown where the pipes  
were away from the wood and brickwork,  
and therefore lost nothing by having the  
heat conducted away. Among the mills  
which sent favorable answers are many of  
the largest in the country, and they do not  
speak until they have thoroughly tested the  
system. The coils of pipe are generally

a bright red heat, it was laid on a large iron  
slab; every sheet was turned over, brushed  
with a wet fir broom, and when the bundle  
had got to a dark red it was placed under a  
wrought iron tilt hammer, and received in  
four minutes 200 to 210 blows—the hammer  
weighing 45 pounds (15 cwt.); after this ham-  
mering every sheet was again examined on  
both sides, and dirt specks removed; particu-  
lar attention paid to there having been no  
welding.

The bundle was again made up as before,  
put back again into the furnace to be again  
reheated; this took 50 minutes. It was then  
again examined; again put under the ham-  
mer at a dark red and hammered for 14  
minutes, receiving 750 blows. This was  
repeated a third, fourth, fifth and sixth  
time in following sequence:

	Packed in furnace.	Under hammer.	Number of blows.
First as noted.....	7 30	4	200
Second time.....	0 50	14 1/2	750
Third time.....	0 30	15 1/2	775
Fourth time.....	0 24	11	550
Fifth time.....	0 30	7	350
Sixth time.....	0 30	7	350
Total.....	8 34	59	2975

The bundle of sheets being examined by  
the hammerman, is handed over to the fin-  
ishers, generally between 2500 and 3500  
blows having been given. The first thing  
for the finisher to do is to examine each and  
every sheet. A 3/4-inch or 1/2-inch plate is  
out on the slab, and each sheet examined;  
between each of the hot sheets is placed a  
sheet of finished iron—or two if the bundler  
thinks best—so that the packet becomes a  
bundle of from 200 to 220 sheets. It is at  
once taken without any reheating, and the  
bundle receives from 60 to 80 blows from a  
cast hammer on a cast-iron anvil; the latter  
must be accurate. (Note cast iron, for in  
the first process wrought is preferred.) Hav-  
ing received this hammering they are called  
"half finished," and then the whole con-  
tents of the bundle is placed on one side to  
cool. This we did by letting them remain  
in rack all night again. The processes above  
noted commenced at 3 a. m., and finished at  
6 o'clock p. m.; the men—six—had done  
nothing but work at four bundles, which now  
consisted of 150 sheets. Next morning at six  
these 150 sheets were cut to exact selling  
size, 56-inch by 25-inch, by hand shears,  
which they find to be cheaper than cutting  
by machine.

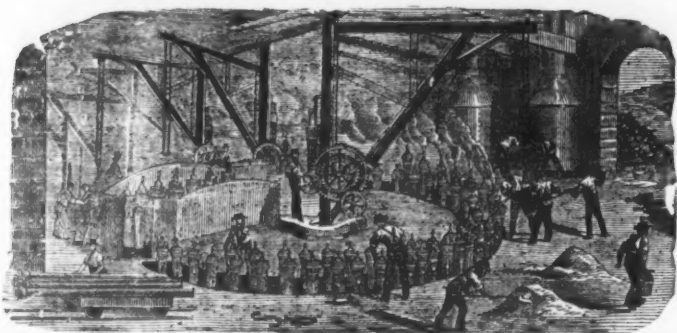
It will be remembered that in the last pro-  
cess the hot sheets were placed between cold  
ones; now the process was exactly reversed.  
Our 150 sheets were cold; a hot bundle of  
150 sheets was brought, and two bundles  
made up, each of 75 old hot sheets and 75  
new cold sheets in process of manufacture,  
care being taken not to put in the hot sheets  
while any appearance of redness remained.  
These bundles were then taken again to the  
polishing hammer, and each received in four  
or five minutes 140 to 150 blows. The ham-  
merman declared, from observing the motion  
of the plates, that they were now ready; the  
bundles were opened and we found certainly  
fine polished sheets. The working tool  
sheets being removed, the new sheets were  
taken to the store and subjected to a  
thorough examination, nearly 30 per cent.  
being condemned as "brack." Taking 180  
pieces of puddled bars, the result was as  
follows: We got 160 sheets; out of these  
160 we lost 12 in the first processes by  
holing, cracking, &c., and on reception in  
magazine 43 were thrown out as imperfect  
from cracks, spots or bluish in polish. The  
remaining 115 sheets were divided into two  
categories—(1) where polish was good, i. e.,  
equal all over the sheet, 67; (2) where gener-  
ally polish was good, but not entirely equal,  
48. The rest were considered "brack,"  
and sold at about £2 per ton cheaper, for  
makers of small articles, on the spot.

Conversing with the men, they said that  
formerly they considered the polish was  
produced by the blow of the tilt hammer  
giving a gliding motion to the sheets; hence  
the name of "glance" iron. It was also  
held as an article of faith that after every  
reheating powdered charcoal must be used.  
This is not the case, for sheets quite as good  
are produced without, but the men are paid  
on the production, and hence the managers  
allow them their own way. I saw a bundle  
of sheets done without the charcoal and  
without the dipping, the results being ex-  
actly the same. The covering sheets were  
not much burnt, the heat of furnace being  
only moderate.—The Engineer.



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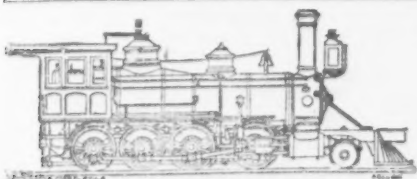
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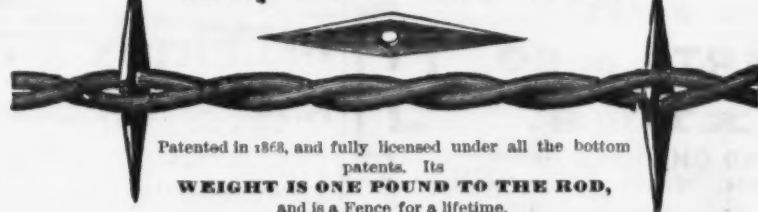
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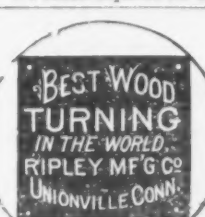
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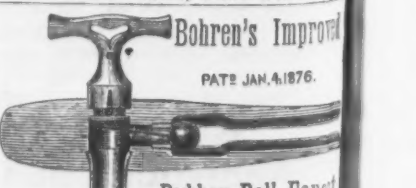
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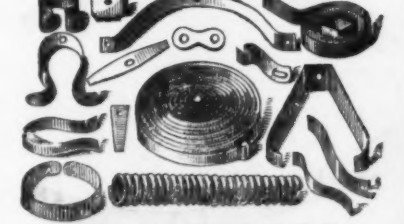
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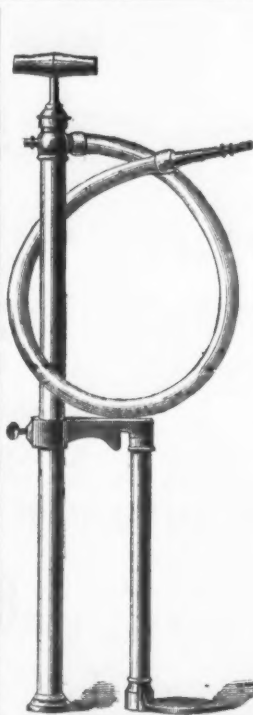
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Mag. Oxide of Iron.....	75.65
Protoxide of Iron.....	.83
Manganese Oxide.....	.09
Alumina.....	4.43
Lime.....	1.32
Magnesia.....	.07
Silica.....	14.89
Phosphoric Acid.....	.09
Sulphur.....	.45
Titanic acid.....	.27
Total.....	99.44

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placed about 2 feet from the ceiling on hanging brackets from the beams, and 1 1/4-inch pipe is the best adapted for the purpose. In addition to the safety from fire, there is the economy of space and every inch of floor space is available. The system is one that should commend itself to those who are engaged in the manufacture of inflammable articles.

## Suggestions for Fire Protection in Foundries.

The frequent destruction of stove foundries by fire gives interest and value to anything in the way of practical suggestions bearing upon the subject of fire protection in manufacturing. We have no data relating especially to foundries and their associated buildings, but from a pamphlet issued by the Boston Manufacturers' Mutual Fire Insurance Co., we gather many valuable suggestions, which cannot fail to have interest for the proprietors of stove foundries. The work of the Boston company relates chiefly to cotton and woolen mills, but much that it has learned from observation and experience applies equally to foundries, pattern shops and storehouses. After giving a long and analytical list of the fires in manufacturing causing losses of over \$1000, the company proceed to offer the following useful suggestions:

First and foremost are mentioned the three factors of safety; these are—good construction, adequate apparatus and discipline among workmen. The absence of any one of these factors often entails heavy losses, as is shown by the tabulated reports of the company. In regard to construction they say: "It will be observed that our distrust of concealed spaces behind woodwork, in which fire can spread and be protected from water, has been forced upon us at a high cost, several of the fires mentioned in the list having become unmanageable from that cause." This method is described as the art of "combustible construction," and is commonly adopted by owners, builders and architects. It is really an inside timber building, attached by combustible braces or furring to an outside screen of stone, brick or iron. Usually such buildings are described as built of the latter materials. Instances are pointed out where risks were refused, because these suggestions had not been complied with, and serious losses had afterward been traceable to these very causes. In one case the alterations had been deferred until another year and the mill was destroyed in the interval. Wooden shutters covered with tin are highly recommended.

The one-story construction is urged as most economical, both in the time needed for erecting and the ease with which it is heated and lighted.

The old-fashioned barn roofs to be found on many of our foundries are condemned. A better construction would be to place a flat roof on the walls. In regard to the use of steam they say:

"In connection with this subject it may not be amiss to call the attention of members to the success that has attended the distribution of steam over long distances for power as well as for heating; the lines of pipe now laid in Lockport, Auburn, Springfield and Detroit are in each case three to five miles in length, and power is carried two miles from the boilers without material loss of pressure.

"The right place for boilers would, therefore, be alongside the railroad, or on the coal wharf, where the coal is first discharged.

"It may also be suggested that the distribution of steam for heating and cooking in factory tenements is a subject worth consideration, especially where mills have extra boilers to operate engines in hot, dry seasons, when water power is insufficient, but which are not used in winter. We might also call attention, if desired to do so, to cases where steam enough is now being wasted to heat all the houses and do all the cooking for the whole establishment.

"There are also many places where a great saving could be made if the primary work on the stock or the weaving could be done at some distance from the carding and spinning mills, provided the moving of the stock could be compassed cheaply and safely."

In regard to the transportation of stock we find the following paragraphs, which apply even more forcibly to the foundry and stove shop than to the mills:

"This point has been covered most fully by the Plymouth Cordage Co., by the adoption of a small locomotive engine, worked by compressed air. This engine (which was built by the Baldwin Locomotive Works) runs on a very narrow track, alongside of which is an air-pipe connected with the compressor in the main engine room. The engine and car are run through the ropewalk and the basements of the various buildings.

"Stock is loaded easily and conveniently, and a boy can manage the apparatus. The engine can be changed by coupling to the air-pipe at almost any point, and the power required to change it is of little moment. It does work that previously required four one-horse trucks, three men to each.

"There are many cases where the narrow spaces on the canal front preclude the construction of any but high buildings; others where both space and water-power are exhausted, but where there is plenty of available land at no great distance, sometimes on a level with the lower and sometimes with the upper floor of the factory. As the air engine carries no sparks, it can be run with perfect safety on an elevated tramway into the porch, where stock can be loaded from the mill elevator on either floor. It may be possible to gain an advantage in the location of a weaving building, or of a stock-house or sorting building, by its use."

We have seen air engines of this class and also small steam locomotives which could be made of the greatest use in handling heavy stock of all kinds. A boy is capable of running them, and if several are in use, one engineer may be employed to look after the repairs. The speed and convenience of these engines is much greater than that of a team of horses when there is much work to do of the kind usually met in foundries.

The prevailing styles of building are made the subject of severe criticism, and points are very justly made against the systems commonly adopted:

"It may be, perhaps, deemed presumptuous

to frame an indictment against customary methods of building that are almost universal, but it must be remembered that it is not many years since the profession of architect had any existence in this country; and while in those few years great progress may have been made in the fine art of architecture, it is also unfortunately true that, as the fine art may progress, the useful art of building has been neglected, in consequence of which neglect the heaviest single tax now imposed upon this nation is the fire tax.

"The owners of property adopt unsafe methods of building, without much consideration, because they are apparently cheap, and rely upon policies of insurance in companies that have been licensed by the State, and are assumed to be solvent, because they meet an arbitrary rule of little value as a test either of management or solvency. Architects are almost precluded even from suggesting better methods of construction, and the art of building is becoming a lost art."

The advice upon construction is particularly valuable and worth the most careful attention. To those who read between the lines this will be found a most startling chapter:

"In respect to the construction of factories and factory storehouses, the advice commonly given is to consider the customary methods adopted by architects and builders, with a few conspicuous exceptions, as the examples of all the faults that are to be most carefully avoided. Before stating our own rules, we may be better understood if we give a statement of common methods of construction that we advise against, and that either require alteration or expensive methods of protection, if already adopted, preliminary to admission.

"This customary method appears to be to construct a very combustible timber structure inside of an incombustible shell, which shell is very far from being indestructible by fire. This timber structure is usually attached to the supporting walls by wooden braces; it is composed of thin material with the greatest number of corners, and having the largest possible area of sawed surfaces most ready to be ignited; the various divisions of the space between the inside timber structure and the outer walls and in the partitions are usually connected by open ways or flues of wood, in which fire can circulate freely and be at the same time adequately protected from water.

"This method of construction has sufficed to assure the maximum of loss from the smallest beginning of fire; but in order, apparently, to make the destruction more certain and complete, if a fire ignites in any part of the building from any small cause, the shavings and other rubbish which accumulate during construction, are in a large degree deposited in these flues and between the floors and ceilings.

"The art of combustible construction has adequately accomplished its apparent object. During the five years ending Jan. 1, 1876, the losses by fire in the United States and Canada have aggregated \$417,750,735. The cost of sustaining insurance companies, during the same period, has been at least \$3,000,000 per annum. The cost of fire departments, not less than \$5,000,000 per annum. Total.....\$587,750,735  
Average per year.....\$137,550,000

"In this period, and constituting a part of the loss, the following structures have been wholly or partially burned:

Hotels.....	8008
Churches.....	415
Schoolhouses.....	850
Railroad stations.....	220
Court and custom houses and town halls.....	100
Hospitals, asylums and almshouses.....	68
Total.....	9555

Almost two a day, Sundays included, for a period of five years."

These losses, large as they seem, are far within the facts, since they cannot be called official statements, many fires not being reported. Those best informed think that they are at least 20 per cent. too small.

Specifically, the constructions to be avoided are:

"Roofs of any shape constructed of common plank rafters 15 to 24 inches on centres, covered with 1-inch boards, iron or any other material, and sheathed and plastered upon the underside of the rafters.

"Boxed cornices of every kind.

"Floor frames of plank 18 inches inches on centres, set edgewise in the u way. Such floors are undesirable, even if not sheathed or plastered on the underside and if sheathed or plastered are more unsafe unless plastered on wire.

"Furrings on side walls on which either sheathing or plastering is placed. Wooden dados furred off. That is, avoid any concealed space behind woodwork.

"Open elevators.

"Iron doors on openings in party walls.

"Iron shutters.

"In general, our motive is to avoid the common construction now prevailing in stone churches, brick schoolhouses, stone and iron warehouses, hotels, hospitals and almshouses."

Upon considering these forms of construction so strongly condemned, it would at first sight appear impossible to put up any building which should avoid all these faults. The proper forms, however, are not so difficult as might be supposed:

"Having thus described the methods of construction and the causes of loss that we endeavor to avoid, we may now state the methods that we advise.

"In order that a building shall be safely constructed, and, on the whole, not more expensively than if built in the customary bad method, the points to be kept in view are few and simple:

"1. That the disposition of the timbers of the frame of both floors and roof shall be made in such solid manner as to burn slowly; that such timbers shall all be open, smooth, and that the corners shall be chamfered off.

"2. That the floors and roof shall be of thick plank, with mortar or sheathing-felt between the plank and boards of the floors.

"3. That there shall be no concealed space in the building, under a floor, behind a furring, or in a partition where a fire can lurk out of the reach of water, or where a rat or a mouse can build a nest of any material; many fires being caused by rats building nests of oily rags or other substances liable to spontaneous combustion.

"4. That all elevators, stairways or other



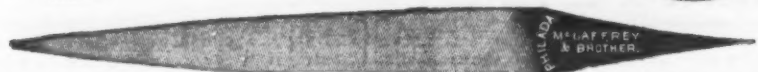
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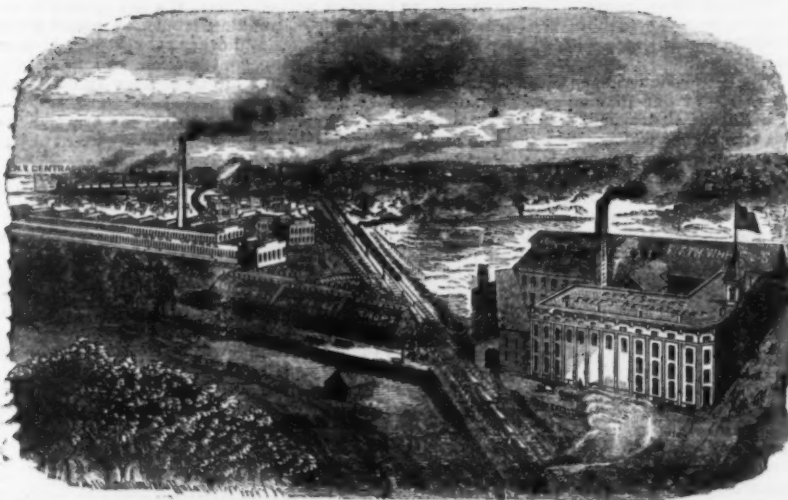
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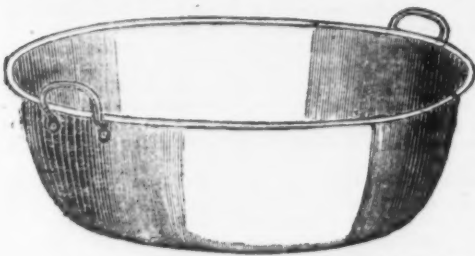
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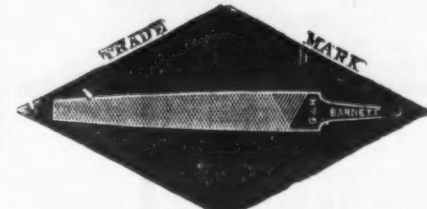
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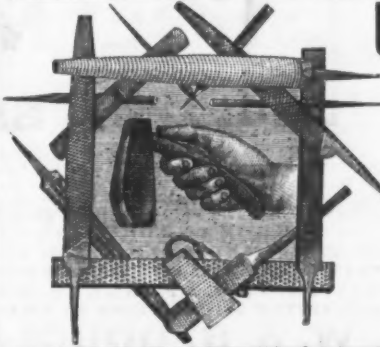
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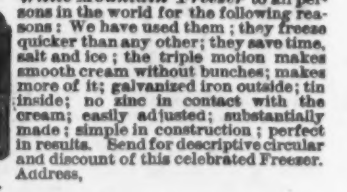
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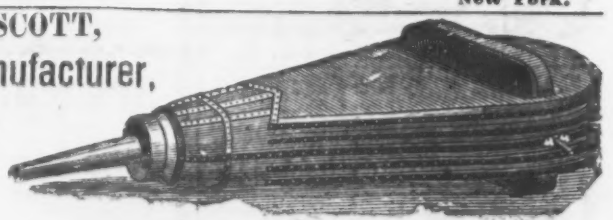
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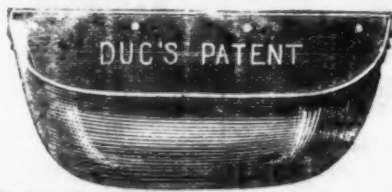
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openings from floor to floor shall be adequately cut off by properly constructed hatches, doors and other appliances, mostly automatic in their working.

"5. That openings in party walls, exposed windows, &c., shall be protected by adequate wooden doors or shutters covered with tin automatic appliances preferred.

"6. That all rooms in which special dangers exist shall be plastered on wire lathing close to the surface of the ceiling and following the line of the timbers; and that all iron or stone posts on which the safety of the building greatly depends, shall be carefully protected from fire, either with wood and tin or wire-lath and plastering.

"The plan submitted herewith gives the simplest construction.

"The company prepares sketches of buildings for its members, when requested to, in such form that the details can be readily worked out by any good builder, and is now prepared to make plans, charging therefor the time spent by our engineers and draftsmen and the cost of the materials used."

"We desire in all possible cases to secure two sources of water supply, and customarily require two or more fire pumps, or one pump and reservoir of sufficient elevation, and a connecting pipe to give an efficient supply of water.

"An adequate pipe service, with hydrants in yards, porches or in the rooms and upon the roofs.

"When possible, the water should stand at the hydrants, both in the yard and in the building, from the tank or reservoir.

"In the building, hose and hose pipes should be ready for use, and should be attached to the hydrants with a drip coupling interposed to take off any water that may leak by the valve.

"Sprinklers in all parts of a building where there is special liability to fire, and generally in all stories above the second, however occupied, especially in the upper story; the Parmelee automatic system preferred. A fire alarm is generally applied to the automatic system.

"Small hose attached at numerous points to the water pipes in the rooms.

"A very full supply of buckets reserved for fire purposes only, and always kept full of water.

"A trained private fire department is required, to be drilled in the use of all the apparatus. Watchmen especially need to be thoroughly trained in the use of the fire apparatus."

In concluding the remarks upon this subject, the following passage occurs: "True insurance does not consist in betting that bad methods of construction and inadequate means of preventing the extension of fire will not result in loss." The true method is to proceed under the rule that no heavy loss ought to occur to the insured, and to take such means in regard to construction as will make losses impossible, or at least highly improbable.

### Resources and Trade of Hayti.

J. M. Langston, the United States Minister Resident and Consul General to the Republic of Hayti, recently arrived in this city on a vacation. Mr. Langston has held several positions under the government, and has been Minister to Hayti for about four years. In a conversation with a reporter, he gave a number of interesting facts respecting the state of trade. The public revenue is derived from exports and imports. The revenue is about \$5,000,000 annually. The currency of the country is American silver. A national bank with a capital of \$2,000,000 has lately been organized. This is preliminary to establishing a national currency. There is a public debt of \$11,500,000, and there is a strong feeling in favor of the honest payment of this debt.

The exports are coffee, logwood, cotton, cocoa, honey and fruits. The exports and imports are rapidly increasing. The country is wonderfully rich and has a great variety of soil and climate, owing to the mountains. There is never any frost, however. Fruits of all kinds grow there in abundance—oranges, lemons, pineapples, mangoes and many others. The people are industrious. The trade is nearly all with the United States, and it offers a very inviting field. It is mostly in the hands of the English. They bring coffee from Hayti to New York, and ship it to Europe. They, of course, favor English manufacturers. For instance, there is a great demand in Hayti for American denims. The people have come to know that American goods are better, yet half of the time they can't get them. English goods are forced upon them.

"I don't understand," continued Mr. Langston, "why it is that while all the trade of the country is with the United States, and while American silver is the currency of the country, yet this trade is all in the hands of the English. Here is the Atlas Line of steamers, which never goes nearer England than New York, yet it is a British line. It started with one little steamer, the Clariel, and the trade has increased so that it now runs 15 steamers, running between New York and Hayti and other West India ports every 10 days. There is another English line, the Royal Mail Line, also running there and doing a good business. Yet during the four years I have been in Hayti, I have had to record the arrival of only one American steamer, and that was a small affair carrying a circus. One single Atlas steamer recently took a load from Hayti, the freight on which amounted to \$18,000. All of the flour comes from the United States. There is a growing demand for dry goods and other like articles, and I think it is time our people began to appreciate these facts. Hayti has recently been admitted to the Postal Union, and it is advancing rapidly. It offers a good field for American enterprise. There are many well-educated people there and good society, but of course they are negroes."

Silver Coinage and Circulation.—According to a statement obtained at the Treasury Department, the total coinage of silver dollars since the passage of the silver bill and up to date, in round numbers, is 96,000,000. Of this amount, 76,000,000 are utilized in the money circulation of the

country—\$7,500,000 in the form of silver certificates, and 18,500,000 in silver dollars. The total coinage of silver dollars will reach 100,000,000 about the 20th of October.

### Flint Fire Bricks.

A new manufacture has recently sprung up in our midst, says the London News, and one which promises well for those who have embarked in it. This is the manufacture of fire-bricks from flints, at works which have lately been started at Charlton, Kent, by the Thames Flint Fire-brick Company, of which Mr. E. R. Salway is the manager. These works are favorably situated as regards transport, having a river frontage and railway communication, but still more favorably as regards the raw material, which abounds in the neighborhood. The bricks are manufactured under Mr. Henry Edwards' patent, the process of manufacture being as follows: The flint stones are first thoroughly calcined in special furnaces constructed for the purpose. The calcined flint is then transferred to a fixed pan in which revolves a pair of heavy edge-runners. The limestone is also burned in a kiln in the usual manner and deposited in a tank, into which water is introduced, and the burnt lime is there partially dissolved. The water in which the lime has been partially dissolved is run into another tank and there allowed to settle, and a proportion of the lime deposits at the bottom of the tank. The lime water is conveyed by pipes to the pan of the edge-runners in which the flint has been deposited, enough lime water being introduced to moisten the flint sufficiently for a thorough mixing. The revolving runners grind and thoroughly mix the mass, taking about a quarter of an hour for each charge of one ton of flint and lime water.

When the mass has been ground and mixed sufficiently for the purpose for which it is intended, it is removed from the pan through a sluice in the bottom. The plastic composition thus formed may at once be molded into brick, but it is improved and brought to a better temper by being kept for a few hours before molding, which plan is usually adopted. The molding, drying and baking processes are effected in the manner usual in the manufacture of the Dinas fire-brick or stone fire-bricks generally. The fire cement is brought into fit condition for sale by drying the plastic compound after it leaves the pan and re-grinding it when dry. It is then ready to be packed in bags or casks for the market. By this method of manufacture, fine goods are produced which consist of nearly pure silica, and which are stated to be quite as capable of resisting intense heat as the Dinas fire-bricks, if not more so. These bricks have been tried in various steel and iron works in furnaces developing intense heat, including the Siemens regenerative furnaces, and the results in all cases are reported to be most satisfactory. This manufacture is interesting and important, as showing how a material which exists in great abundance in the locality, and hitherto of little value in the industrial arts, may be turned to good account in producing the only fire-brick of the class manufactured in the neighborhood of London, the products being of exceptionally high quality.

Japanese Glue.—This glue or cement is made by mixing finely-powdered rice with enough cold water to make it into a smooth paste, then adding boiling water until it is about the right consistency, finally boiling it in a suitable saucepan for one or two minutes. This cement is strong and of a white color, and so is well adapted for a variety of work, especially that of a delicate nature.

Toughened glass, about which there was much written five years ago, has never taken the place of ordinary glass, although undoubtedly superior thereto. Its extra cost is probably the cause of its failure to win popular favor. Now, however, Mr. Frederick Siemens proposes to adapt the toughened glass made by his process to the manufacture of street lamp posts, water mains and other articles made of cast iron. He claims that his glass is stronger than iron castings, imperishable and incorrodible. The cost per pound, allowing more profit to the maker than can be obtained from iron, is twice as much as the cost of the latter, but the specific gravity is so much less that the consumer will be able to obtain glass articles about 30 per cent. cheaper than similar goods in cast iron. Even with such experienced inventors as Siemens, however, performance does not always keep pace with promises, and the difficulty of revolutionizing industries and the use of materials is so great that, whatever may be the merits of toughened glass, it will take a long while to bring it into common use.

The Révue Industrielle illustrates and describes the steam ferry boats constructed by Stapfer, De Dulos et Cie, of Marseilles, for use in that port. These boats consist of two flat-bottomed iron hulls 33 feet long, 40 inches wide and 5 feet high. These are placed about 7 feet 6 inches apart, and upon them is laid the deck. In the middle are the engine and boiler, driving a screw, which is placed midway between the two hulls. On either side of the engine is passenger accommodation, the compartments being arranged somewhat on the same plan as a tram car. Forty passengers can be carried, and the total weight, when they are on board, will be about 19 tons. The engine, which develops a power of from 16 to 18 horses, has a 9 inch cylinder, with a 6-inch stroke. The speed does not exceed 4 knots, but for the short distance which they travel it is considered sufficient.

At the recent trial of sheaf binders after the Royal Agricultural Society show at Derby, the McCormick Harvesting Machine Company carried off the first prize—a gold medal. The trials are reported to have proved that the machines of the Appleby type are the most efficient binders now in the field.



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CUSHION BELT  
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To introduce we offer HOLLOW GROUND RAZORS at \$1.50, \$1.75, \$2; Ivory, \$2.50. Our SWED-  
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and various items which we can sell at  
SPECIAL & ATTRACTIVE PRICES.

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WE INVITE THE ORDERS OF THE TRADE.  
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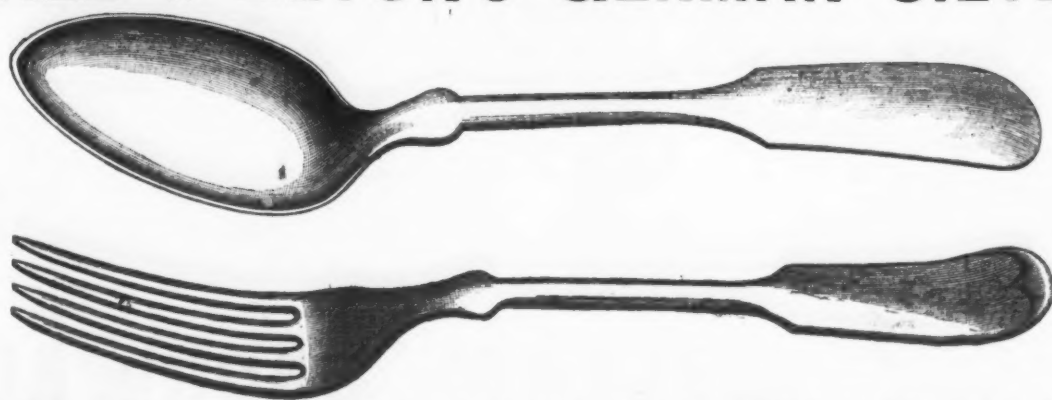
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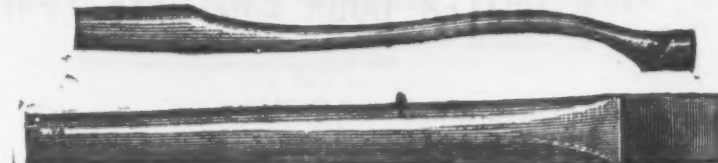
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## SCIENTIFIC AND TECHNICAL.

Prof. B. Tilliman, in a paper contributed to the American Journal of Science, describes

A LARGE DEPOSIT OF SULPHATE OF SODA, or thenardite, as it is called by mineralogists. It occurs on a bench about 50 or 60 feet above the river Verde, Maricopa County, Arizona, and crops out for a distance of 800 feet. By an analysis in the Sheffield, laboratory, under the supervision of Prof. O. D. Allen, by Mr. Geo. M. Dunham, its constitution was found to be as follows:

	I.	II.
Chlorine.....	0.095	0.097
SO <sub>4</sub> .....	56.410	56.310
CaO.....	0.120	0.110
MgO.....	0.021	0.023
Na <sub>2</sub> O.....	42.364	42.370
Insoluble.....	0.370	0.370
Total.....	100.000	100.000

Considerable attention has lately been attracted to

DOLBEAR'S INDUCTION TELEPHONE, which is quite unlike any of the instruments previously brought to the public notice. It is, in fact, an articulating air condenser; but it is so neatly contrived as to constitute a novel invention. The receiver is in shape and size like a watch telephone of the Bell order, but it consists merely of an ebonite case, inclosing two parallel metal diaphragms insulated from each other by the air and ebonite. The back plate is fixed round its rim, and at its center by a screw which bears upon it, and the front plate is free to vibrate before it. A hole drilled in the middle of the latter opens into the cavity in the case which is placed against the ear. These plates are connected in circuit with the line. The transmitter consists of a Reiss telephone, in which the platinum spring contact is replaced by a carbon contact—that is to say, a microphone contact—and the vocal current is passed through the primary of an induction coil, which has its secondary in circuit with the line. The secondary currents, after traversing the line, enter the fixed plate of the receiver, and by their attraction on the free plate set it into audible vibration, which is heard as speech or music. It is not even necessary to connect the front plate to earth, for if it be in connection with the body of the listener through the case, he will hear the message all the same; and receivers are made with only one terminal. Dolbear's telephone will be exhibited at Paris; and it is said to be remarkably free from the extraneous noises heard in the Bell instrument. Foreign advices call attention to some recent

IMPROVEMENTS IN VOLTAIC BATTERIES, which are likely to have interest for American readers. Some time ago M. Azapis suggested using a solution of chloride of sodium or of sal ammoniac for the acidulated water in contact with the zinc of a Bunsen battery, and the success of the change has led Mr. David Lindo, of Falmouth, Jamaica, to substitute sulphate of sodium for the dilute sulphuric acid in contact with the zinc of a Grove battery. Chlorine compounds might prove injurious in the Grove, and were therefore neglected for the sulphate of sodium. The substitution has given good results; no amalgamation of the zinc is required, and the intensity of the current is as great as where dilute sulphuric acid is employed. Moreover, the solution of sulphate of sodium answers equally well in the Bunsen cell.

Few things are of more value to the steam user than a knowledge of the VALUE OF DIFFERENT KINDS OF COAL, yet few things are usually less understood. The Stockton and Middlebrough Water Board (England) has been experimenting on the coal that has been offered to it, in reply to invitations for tenders, to test the value of the coal for its special uses. Nine kinds of coal were tested, the tests lasting from seventeen hours to a full day, and from seven to ten tons of coal being consumed in the test. When it is stated that the weight of coal used to pump one million gallons of water varied from 1 ton 17 cwt. to 2 tons 7 cwt., and that the water company pumps weekly close upon sixty million gallons, the importance of the test will be seen. Very naturally the conclusion was come to that the mere pumping power of a ton of coal was not the sole consideration, for the price must be a prime factor in that question. The price of the coals tested at the works in question varied from 4/9d. to 6/11d. per ton, and this rather complicates the question. It was, however, found that the cost of pumping one million gallons—so far as the coal was concerned—was easily determinable with the data above hinted at, and the cost varied from coal 11/2d. to 13/9d. per million gallons pumped, and when the quantity of the slag or clinkers at the end of the test was deducted, the comparative value of the coal for that special purpose was easily ascertainable, and the best and cheapest for that purpose was decided on. It would be well if the experiments thus alluded to could be carried out on a larger scale, and with the variations that different prices and kinds of coals in different localities gave, for it is certain that the manner in which the full power of coal can be utilized for different purposes has not yet been sufficiently considered. The test at the water works is one that can be cheaply carried out, and to the profit of its users, and it is to be hoped that it may be so carried out more generally.

A Dr. Hahn, of Tuebingen, thinks he has discovered

TRACES OF FOSSILS IN METEORITES which belong to the siliceous division. One class of meteorites is entirely metallic, the other, containing siliceous substances, has been subjected to examination, and the Doctor believes he has been able to prove that they are composed almost exclusively of fossil organisms. Dr. Weinland, to whom Dr. Hahn intrusted the classification of these organisms, compares them to the detritus of coral rocks. He adds that complete forms are rarely to be met with, but elements sufficient to reconstruct them. He has succeeded in establishing the existence of about 50 species of polyps, algae, glued together by a siliceous cement. These fossils sometimes present much resemblance to those

of terrestrial origin. At present these conclusions can only be accepted as hypothesis requiring verification.

The following notes on

THE COST OF WATER POWER IN AMERICA were obtained by the Water Power Company, of Lawrence, Mass., during the progress of a suit against the city of Boston. Mr. H. F. Mills, engineer of the company, testified that \$12 per day for water privilege was cheaper for the mills at Lawrence than to start their engines and use steam power. The cost of a mill power is only about \$2.50 per day in Minneapolis. At Lawrence, Mass., all the mills have engines which are used as auxiliary power, and they pay \$1200 per year for their water privilege. It might be a fair general statement to say that a horse-power produced by steam would cost about \$50 per year more than a horse-power produced by water, as demonstrated by actual comparison at Lawrence, Mass., where power is used in large quantities. A mill privilege at Minneapolis is now worth \$750 per annum, the theoretical power of which is 75 horse-power. This gives a capacity of 135 barrels of flour per day. The cost per barrel at this rate is a little less than 2 cents per barrel, being a great saving upon the cost of grinding by steam power.

Studies of special phenomena have become very popular since it has been found that valuable results are often obtained in this way. Recently, a French gentleman—M. Lespaulx by name—has been studying the subject of

THUNDER STORMS in the Gironde, and comes to the curious conclusion that valleys are more struck by hail than hills or table land. It seems that a certain depth below the clouds is necessary for the formation or the fall of hail to occur without obstacle. Further, the direction of the valleys traversed have a marked influence on the direction of the clouds, though they only cause a momentary deflection, and the clouds, after following them a certain time, are carried on in the general direction of the vortical movement. For example, if a valley be in the axis of the zone of hail, or a little inclined to that axis, the hail clouds seem to be carried along that valley as dead leaves are carried along by the wind in a trench. If the valley be subdivided by a mountain spur into two others, the hail cloud also divides and the two secondary valleys are ravaged in their turn, at least to the extent in which they are within the zone of hail. Valleys lying across this zone have also an influence, though less marked. When the clouds pass over them they show a tendency to descend and to spread out on the two sides of the zone, so that the zone is broader over valleys than over plateaux, and the ravages are often greater. It might have been added that this was to be expected, since storms and air currents of all kinds generally follow the depressions of the earth, being guided by the hills to a very great extent.

It is notorious that the water supply of continental towns is bad and the

RESTORATION OF AN ANCIENT AQUEDUCT,

of the reign of Augustus, recently completed as part of the works for the supply of Bologna with water from the Setta, near its junction with the Reno, about ten miles from Bologna, suggests that possibly some of the other old aqueducts, or works connected therewith, though in a more or less ruined state, might be brought into use. There are the Aqueduct du Gard, which once formed part of the water supply works of Nîmes; the Aqueduct de Ségovie, also built by the Romans; the Aqueduct de Maintenon, built in 1684-5 for the supply of water from the Eure at Pongoin to Versailles; and the Claude Aqueduct, near Rome. Of course, many of the aqueducts in a more or less ruined state are wholly useless, and this may be so with some of those mentioned; but this is not necessarily the case with all. Some of the works no doubt remain tolerably intact, as in the case of the underground tunnel which brought, and now again brings, the water into Bologna. The Romans in constructing these supply works followed the course of the Reno, tunneling the hills, sinking their work beneath the beds of the precipitous torrents which rush from the mountains into the river, and thus bringing the waters to the gates of the city, where they were divided, one portion going to supply the public baths, and the other probably destined for the fountains of streets and public squares. The restoration of this important work is due chiefly to Count Gozzadini, who caused an accurate survey of the aqueduct to be made about twenty years ago, and in 1864 published the results of the investigation in an elaborate memoir. Since then, a contemporary says, the work of restoration has been going on with a thoroughness and skill calculated to make the new work as enduring as the old. The aqueduct was originally made of brick and stone, cemented with lime and volcanic sand, and the unbroken portions remained as hard as granite. The work of tunneling and the masonry were so thoroughly well done that both stonework and brickwork are still as solid as the rock itself, the only considerable breaks being where the turbulent Reno had washed away with its clay banks several portions of the aqueduct, or where the headlong torrents which rush down into its stream had excavated their own beds and carried away the artificial substructure.

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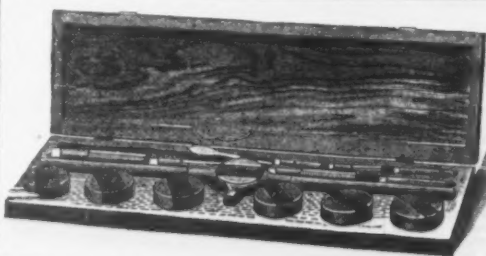
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Pump Rods, Tubes, Screws, Jack Chains,  
Rolled Bolts, Nails, Wire Cloth, Sash Cords,  
Sheets, Boat Nails, Pens, Wire Ropes,  
Plates, Tacks, Sash Chains, Cast Kettles.

**INGOTS FOR CASTING.**  
Send for Pamphlet and Price Lists.  
**PHOSPHOR-BRONZE.**

offers a peculiar interest. First, there are  
seen vapors produced by the combination of  
oxygen and nitrogen; but this combination  
is soon destroyed, and the gas appears color-  
less again, because of the oxygen combining  
with the carbon. Nitrogen and carbonic  
oxide then remain in the vessel. While the  
hyponitric acid vapors are in the vessel the  
arc changes in tint and elongates; but at  
last, when the chemical transformations are  
complete, the arc is good and of a greenish  
blue. The important point, however, it is  
stated, in a practical sense, is that it becomes  
quite fixed, and varies neither in color, posi-  
tion or intensity, as all naked arcs, however  
well regulated, still do. The spectrum is that  
of carbon raised to incandescence without  
burning, a spectrum such as has been ob-  
served in the tail of the recent comet by  
M. Thollon. On the other hand, the spec-  
trum of a naked arc glowing in the air is  
complicated by that of burning carbon. In  
an inert gas, therefore, the arc is a purely  
electric phenomenon, and it can be directed  
by electro-magnetic action. The ordinary  
arc, again, is composed of this electric  
incandescent current, and the flame due to  
the burning carbons and their irregular  
waste. The cessation of burning also stops  
the waste of carbons. When the Jamin  
candle burns in the open air it is consumed  
at the rate of 16 millimeters per hour;  
when closed in a sealed vessel this consump-  
tion is reduced to 0.2 millimeters per hour.  
Each candle lasts 160 hours, or 16 times  
longer than when burned free, and each  
lamp 800 hours, or 80 nights of 10 hours  
each. Not only the fixity of the arc, but its  
durability, is thus very much increased.  
An interesting account has recently  
been published of an English

TRIAL OF STEAM LAUNCHES.  
one by Herreshoff and the other by an Eng-  
lish builder. The trials extended over three  
days, and were made by the steam depart-  
ments at Portsmouth Dockyard with a  
Herreshoff and a White's 45-foot launch.  
The Herreshoff is worked on the inventor's  
coil boiler principle, and has both the engine-  
room and the stokehold inclosed, forced air  
being used at a pressure of 2 inches as mea-  
sured by the water gauge. White's, on the  
other hand, is an ordinary service pinnace,  
having only the stokehold inclosed, and is  
propelled by twin screws. As the result of  
six runs on the measured mile in Stoke's  
Bay, the Herreshoff realized a mean speed of  
17 1/2 miles (5.124 knots), and White's a  
speed of 14 1/2 miles (12.604 knots) an hour.  
No diagrams were taken, as Mr. Herreshoff  
objected to their being taken with a closed  
engine room, so that the horse-power devel-  
oped was not ascertained. The vessels were  
also tested with respect to the economical  
consumption of fuel. Each pinnace took on  
board 10 cwt. of coal, and having proceeded to  
the westernmost measured mile buoy,  
were kept running at full power until the  
engines stopped for want of steam on the  
consumption of the coal. The Herreshoff  
went twenty-eight times round the buoys  
before its fuel was exhausted, while Mr.  
White's boat, after going twenty nine times  
round the buoys, proceeded into harbor, hav-  
ing about 258 pounds of coal unconsumed at  
the end of the trial. This was rather an  
unfair trial, considering that one boat could,  
and did, sail nearly 3 miles per hour faster  
than the other. Mr. Herreshoff may well  
be proud of his boat and her performance,  
which is worthy of record.

## The "Fair-Trade" Movement.

Mr. Samuel Morley, M. P., of London,  
reached New York last week, and was im-  
mediately induced by an enterprising inter-  
viewer to give his views with regard to the  
so-called "fair-trade" movement. His  
utterances are interesting, but we think  
that if he had postponed the interview until  
he had learned what he will probably learn  
in this country, he would have talked very  
differently in many respects. We quote him  
as follows:  
"For England to attempt to consume her  
own manufactures would be madness. They  
are so great that she needs the world for a  
market." But England is tired of having her  
doors open to the productions of other coun-  
tries and having her exports taxed by them  
at such an exorbitant rate. The people of  
England must have food, and it must be ob-  
tained from some foreign country or from  
the Colonies. It is only natural that we  
should seek to get this food supply from a  
country where we can pay for it by our  
manufactures. If the United States persists  
in taxing our exports so highly, we shall be  
forced to try to get our supply of food from  
Canada."  
"Does not Canada impose a tariff on Eng-  
lish goods?"  
"Yes, but no doubt some arrangements  
could be made by which the tax on English  
goods would be almost or altogether removed,  
if Canada should understand that from her  
England was to draw her supply of food. A  
reciprocal arrangement could, I think, be  
very easily effected. Besides, if the farmers  
of the United States—and I understand that  
three-fourths of the population are con-  
nected in some way with agricultural pur-  
suits—should find difficulty in disposing of  
their crops, they would soon create a senti-  
ment in favor of free trade which all the  
power of the nation would be unable to re-  
sist. We will reach you through your farm-  
ers. Suppose England transfers all her  
orders for grain to Canada and other Col-  
onies. The demand for corn raised in the  
States would be so much diminished that  
large quantities would be fed by the farmers  
out West to their pigs, and the increase of  
hogs would glut the pork market. And so  
one thing would act upon the other till the  
whole agricultural population of the United  
States would clamor for free trade with  
England. The question of fair trade is now  
assuming an important part in English poli-  
tics, and will soon be the great issue. The  
old 'League' has been revived, and is pre-  
paring to take up the cudgels in the coming  
elections."  
"Which of the parties is likely to be the  
champion of a retaliatory tariff?"  
"The Conservatives, although many Lib-  
erals are in favor of it, and the question is  
of so intricate a character that many heret-  
ofore staunch free traders are shaken in  
their convictions. The way the matter will

probably be settled, is that a reciprocal ar-  
rangement will be made with some foreign  
nation or with some Colonies, and those na-  
tions refusing to enter into a fair arrange-  
ment will be left out in the cold. We look  
to Canada as a country capable of producing  
an immense amount of grain. A large belt  
of arable land is ready for the ploughshare,  
and if the mother country exerts herself in  
that direction, Canada may become the  
granary of Great Britain. The common  
people in England are in favor of free trade,  
but a large portion of the more influential  
class, especially manufacturers, are begin-  
ning to look for a retaliatory tariff. No one,  
of course, would propose to impose a duty  
on breadstuffs and meat. Our policy would  
simply be to buy our food where we could  
pay for it by our manufactures. The pres-  
ent depression in England is due to the im-  
mense prosperity of the last few years.  
Though there is no large amount of  
goods on hand, yet great difficulty  
is experienced in finding a market, the  
demand of which will keep the mills all  
running. The duties imposed by the United  
States on English imports are exorbitant.  
Americans pay three-fourths as much again  
for English goods as they need to do and  
seem glad to do it. But I think a sentiment  
is growing in this country in favor of fair  
trade, if not of free trade. I have been and  
am a free trader, but I do not think that  
Richard Cobden ever thought that the other  
nations would keep their policy of protective  
tariff. The agitation in England is not so  
much for a retaliatory tariff, however, as it  
is for dealing only with those countries  
which admit British goods free of duty. All  
classes of society are in favor of this, and  
the time will come, I think, when the United  
States will be forced to look at the matter  
differently from what it does now. England  
imposed a duty on spirits and on tobacco,  
and there is no disposition to make it less  
than it is. A treaty is about being con-  
cluded with France in which we are to have  
what is called the "most favored nation"  
clause. That is, whatever privileges France  
grants to other nations we are to receive  
the benefit of. The goods which we import  
from France are of much less importance  
to the country than those which we get from  
the United States. I think that some mutual  
arrangement will be made in regard to  
duties which will be satisfactory to all con-  
cerned. The United States and England  
should not be at variance on this point. The  
two countries have a mission and should  
move to it side by side."

## Canal Steam Navigation.

We learn from an engine builder and  
practical navigator, that the large expecta-  
tions of an increase of steam power on the  
canals of this State have been but partially  
realized since the opening of the season.  
Boatmen very early became discouraged by  
the gloomy prospect of remunerative  
freights, growing out of railroad competi-  
tion, and declined to make any further in-  
vestment at present in floating property.  
Nevertheless, our informant says, ten or  
twelve steamers have been added to the  
canal fleet, bringing up the total to about 75.  
He thinks that with the improved freights  
now realized, and the prospect that railroad  
strife will not last for ever, there is a fair  
outlook for the coming spring. A local  
merchant and forwarder in New York, con-  
versing on this subject, said:  
"Next to a free canal, nothing is so neces-  
sary to cheapen transportation on the canal  
as the use of steam power, in practical and  
satisfactory substitution for animal power,  
and of a cheap application to the canal boats  
now doing the business of the canal. Though  
the speed be doubled only, so that the boats  
are towed three miles an hour, the benefits  
arising from such an increase would be im-  
mense. English grain merchants recognize  
this in already estimating the saving of in-  
terest on their business with this country,  
in buying and exporting grain, by saving  
even a half-day's time in transportation.  
Also, in having their grain subjected to a  
shorter time to the warmer waters of the  
canal, as compared with the lakes and the  
St. Lawrence River—a cause of diverting  
now a great deal of grain to Montreal for  
export."  
"The great need of higher speed on the  
canal is evidenced by individual and public  
efforts in that direction, especially as stimu-  
lated by the prize law of this State. Efforts  
to accomplish this by constructing very  
meritorious steam canal boats, have resulted  
in partial and limited success. The most of  
those in use cannot compete with animal  
power, and are only profitable when high  
freights are current. The cable system is  
now in daily operation on the canal between  
Buffalo and Rochester. The speed is greater  
than the boatmen prefer, but is easily con-  
trolled to meet their wishes. It only needs  
to be generally adopted by the boatmen to  
have the acknowledged advantages of steam  
on the canals enjoyed by all. The cable has  
been working for a year between Buffalo  
and Rochester, and during the present sea-  
son between Syracuse and Utica, and when  
completed the cable system will be in opera-  
tion more than one-half the entire length  
of the canal."  
Private accounts received in this city  
through mercantile sources indicate a re-  
vival of trade movements in Peru, the  
coercive policy of the Chilians seeming to  
have been partially relaxed. Merchants in  
New York are filling a few orders from  
Lima. At the time of the departure of the  
last South American mail, strong hopes  
were entertained that Generals Kilpatrick  
and Hurlbut would speedily reconcile ex-  
isting differences between Chili and Peru,  
and aid in re-establishing legitimate govern-  
ment. The principal impediment arises  
from the proposed acquisition by Chili of  
the entire province of Tarapaca, as indem-  
nity for losses in war. The Peruvian Con-  
gress, which meets at Chorillo, has author-  
ized Provisional President Garcia Calderon  
to make terms with the Chilians, but has  
prohibited him from ceding "a foot of terri-  
tory." How terms of peace can be reached  
under such circumstances is a question  
which may be solved by friendly interven-  
tion.



# The Iron Age

Metallurgical Review.

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DAVID WILLIAMS, Publisher and Proprietor.  
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Thirty-first Page.—Boston Hardware and Metal Prices.

Considerable discussion has followed the publication of a charge against the Standard Oil Company, of giving short measure in oil barrels. The charge is to the effect that the oil is short from one to four gallons on each barrel. This, on 40,000 barrels production a day, would amount to a snug sum. The story seems too improbable for belief. We have not the least doubt that the Standard would buy a Legislature or crush out a competitor, without the least twinge of conscience, but it has not yet gone into the

business of stealing oil a gallon at a time. Besides, such a thing would be readily detected. Any one can gauge a barrel of oil, and it is absolutely impossible that this practice could have continued, even had the Standard been so minded.

### Our Imports and Consumption of Iron for the Fiscal Year.

The summary statement of the Bureau of Statistics for the year ending June 30, 1881, a synopsis of which we published last week, is of considerable interest in its figures of imports of iron and amount remaining in warehouse.

The imports of certain forms of iron, &c., for the fiscal years 1880 and 1881, is as follows:

	1880, Tons.	1881, Tons.	Inc. or Dec., Per Cent.
Pig iron.....	85,116	47,343	D, 44
Bar iron.....	125,031	57,743	D, 59
Boiler iron.....	428	115	D, 53
Band, hoop and scroll.....	17,288	8,976	D, 49
Railroad iron.....	96,656	131,027	I, 35
Sheet iron.....	11,853	5,720	D, 51
Old and scrap iron.....	61,190	26,147	D, 60
Steel ingots, bars, &c.....	74,461	20,571	I, 74
Steel rails.....	74,461	20,571	I, 74
	1880, Value.	1881, Value.	Inc. or Dec., Per Cent.
Pig iron.....	\$14,634,027	\$8,595,558	D, 40
Bar iron.....	5,102,710	2,494,670	D, 52
Boiler iron.....	21,204	4,097	D, 64
Band, hoop and scroll.....	716,393	348,744	D, 51
Railroad iron.....	2,729,139	3,688,338	I, 32
Sheet iron.....	85,680	61,404	D, 29
Old and scrap iron.....	12,394,413	6,317,442	D, 52
Steel ingots, bars, &c.....	4,998,497	6,317,442	I, 35
Steel rails.....	4,998,497	6,317,442	I, 35

The most noticeable fact shown in this table is that there has been a marked decrease in 1881 in the quantity of imports of all kinds of iron and steel, except those that are used in railroad construction, for in this category we must include steel ingots, bars, &c., much of which has largely gone into railroad construction, being rolled as rails and worked up into springs. It will also be noted that the decrease in the amounts imported varies but little in the entire list, being between 50 and 60 per cent. On the other hand, the decrease in the values imported differs materially from the decrease in amount. The decrease in the values of pig, bar, sheet and scrap iron is less than the decrease in amount, which would show that the average values of these grades of iron are greater in 1881 than in 1880. On the other hand, the decrease in values of boiler, band, hoop and scroll is greater than the decrease in quantities, indicating that the average values of these are less in 1881 than in 1880. By similar reasoning we find the value of railroad iron less in 1881 than in 1880, and of railroad steel greater. Of course, a division of values by amounts would show a similar condition of values per unit.

In order to arrive at the amount of these grades of iron actually consumed in the several years, however, it is necessary to take into consideration the amount remaining in warehouse on June 30, 1879-1881. These amounts are as follows:

	1879.	1880.	1881.
Pig iron, tons.....	3,014	178,892	42,495
Bar iron, tons.....	3,781	16,924	8,449
Boiler iron, tons.....	3,849	1,148	1,148
Band, &c., tons.....	37,272	20,887	20,887
Railroad iron, tons.....	70	1,181	1,551
Sheet iron, tons.....	123	121,584	66,148
Old and scrap iron, tons.....	\$3,793	\$431,083	\$167,455
Steel rails, tons.....	14,710	22,719	22,719

On the whole, this table indicates that more tons of these forms of iron and steel were consumed in the United States in 1881 than were imported; or, at least, there was less stock in the warehouses on June 30, 1881, than on June 1, 1880.

The ingenuity of criminals is often so surprising, that we are forced to wonder what they might not have accomplished if they had turned their talents to practical account in some useful and honorable calling. But the fact that we rarely find such talents among honest men, leads to the conviction that phenomena of the Jack Sheppard type could not be honest if they would. The latest illustration of ingenuity which overcomes all mechanical difficulties, is furnished by a man who has for some time been confined in jail at Somerville, N. J., awaiting trial on a charge of burglary. During his imprisonment he from time to time scraped away a sufficient quantity of lead from the water pipes to make a piece half as large as his fist. These scrapings he melted together in a solid lump in his tin dipper, by means of a fire made from shavings of wood from the bunk in his cell. Out of this lead he fashioned two ingenious keys that would open jail locks. On Thursday evening he unfasted, by means of these keys, the lock holding the bar that kept all the cell doors closed, and also a padlock that fastened the door of his own cell. Before he had time to use the keys on the outer doors and escape from the building, the keeper paid an unexpected visit to the jail and caught him. For some years past the man's principal occupation has been breaking out of jail, but

the fact that he has been so often caught shows that he is not so smart as a good many others who, once incarcerated, would be likely to stay in jail until let out.

### Trade Prospects.

In New York is to be found the commercial pulse of the nation, and, in current parlance, it is satisfactory to be assured by representatives of all the leading branches of business that "the condition is normal." The speculative fever which has raged in Wall street for many months, with slight intermissions, has not affected business appreciably in any of the legitimate channels. More than this, some of the old merchants who have been consulted have no fears of the consequence of possible reaction in the financial market, as the money now attracted to speculation would be thrown back for investment elsewhere. Even in the contingency of the death of the President, there would be no apprehensions of disturbance.

As yet, the fall trade proper has scarcely commenced, although buyers from the more remote markets of the West and South have already made a large portion of their purchases in the dry goods and grocery lines, quite sufficient to indicate a prompt payment of obligations on their part, and a prosperity equal at least to that of last year. The partial failure of crops in some parts of the South and West, owing to the drought, has induced more caution in buying, and perhaps a more careful examination of credit accounts; but it is not believed that the volume of transactions will be sensibly affected. As the rule, the Southern man buys for cash. Western merchants, taking advantage of the low rates of transportation, are already making their appearance. It is believed that the agricultural classes will be liberal consumers. They have the profits of two years of large prosperity to draw upon, if necessary, and it is confidently predicted that the higher average of prices this year will make good the shortages of the harvest. Altogether, the outlook is considered satisfactory.

### The Example of Industrial Arbitration.

We have several times alluded to the existence and working of an arbitration board for the settling of labor disputes in the cigar factory of Messrs. Straiton & Storm, in New York City. This is the only arbitration board in this country, though there is a large number of them in England, governing the wages of some hundreds of thousands of working men. This New York board grew out of the great strike of 1876, and has been in active operation since that time. In its constitution it differs from all other boards of which we have any knowledge. It is composed of nine members, five of whom are employees, three others are quasi-employees—that is, foremen employed by the firm—and the ninth is a member of the firm. In any event, the employees have an actual majority in the board, and can, if so inclined, decide in their own interest.

This board has recently been called upon to decide a demand for advanced wages, and the conduct of the case furnishes a most interesting chapter in the history of industrial progress. The demand was from 700 employees in the mould-working department, and was based upon the increased cost of living. This demand was really in violation of a promise made in 1880, at a time when other shops reduced their wages but this firm did not. The promise was that there should be no demand for an advance when trade got better, until other shops came up to the same price that Straiton & Storm were paying. When the demand was made Mr. Storm asked the men to get the prices paid in other shops on the same classes of goods, and at the meeting of the board it was found that, on the nine grades of cigars made by the mould workers, Straiton & Storm paid an average of 60 cents more per thousand than was paid in the other factories. Some of the men argued that this did not make any difference; that the men were poorly paid; that some one had to make a beginning in advancing prices, and, though they were paying 60 cents more, it might as well be Straiton & Storm as any other firm. In other words, the argument was: We will take all we can get, fair or unfair. The discussion, which we cannot reproduce, was mostly in this vein, but when the question of an advance was put to a vote, but two men voted for it and seven against it. In other words, three of the cigar makers voted against their fellows, and this though in the discussion the speakers claimed they were unanimous in the demand.

The case before this board was, in the amount involved, of small import. What it involved in its result and in its teachings, was of no common import. At the close of the meeting Mr. Storm, in an address, stated his gratification at the action of the board, not because the decision was in favor of his firm, but because it established the broad principle that the workmen could be trusted with a voice in the adjustment of their wages, and because a spirit of fairness had governed them. These are hopeful signs, and it is certainly a source of regret that this system could not be tried in other industries.

The *Free Trade Bulletin*, which has just made its appearance in this city, starts off with the following at the head of its first column: "Free speech, free press, free soil,

free men! Why not free trade!" Because free speech has emphatically pronounced against it; because our free press has generally lent its powerful influence to the encouragement and diversification of American industry; because our free soil would not remain free if tilled to supply England with materials to be returned to us as manufactures; because an overwhelming and unquestioned majority of our free men have cast their ballots for twenty years in favor of the policy of protection to home industry. These are reasons enough "Why not free trade!"

### The Boston Decision on Open-Hearth Metal.

As the facts concerning the recent decision of the jury at Boston, in the case involving the duties on open-hearth metal, become better known, the wonder grows as to how a jury could render such a verdict. The question at issue was this: Is open-hearth metal steel or iron? Under the claim of the plaintiff allowed by the court, the question turned upon what Congress meant by "steel in bars," and "iron in bars," in the tariff enacted in 1873. This turned again on what was the commercial designation of this metal at that time; in other words, was this metal known as iron or steel in 1873?

The testimony of the plaintiff, who desired to have it brought in as iron, was almost all general, and to the effect that all metallic compounds of iron that would not harden and temper were known as iron, and all that would so harden and temper were known as steel. On the other hand, the defendant showed by a mass of testimony that the metal in question was known as steel. Some of this testimony was very strong. For example, Mr. Ralph Crooker, formerly superintendent of the Bay State Iron Works, who made the open hearth steel as early as 1872, testified that he had always known it as iron, and yet he was confronted with an old memorandum book of his own referring to this metal as "Martin Steel;" the trade-mark under which it was sold contained the words "Bay State Steel," and circulars of this company of 1872-74 were shown, in which the company advertised the metal as steel. Representatives of Hussey, Wells & Co. testified that since 1851 they had sold as steel metal that was required not to harden. The mass of testimony from many of the steel makers of the country, showing that low carbon metal that would not harden or temper had for years been sold as steel, was a surprise even to steel manufacturers themselves—and yet the intelligent jury decided the metal was iron. This case shows the necessity, not only of amending the tariff act so that there shall be no doubt as to its meaning, and so that metal made by the open-hearth process shall be classed as steel, the same as metal made by the Bessemer process now is, but it also shows the necessity of some tribunal more intelligent in these matters than a jury to decide these questions. It may be well to say that the government has taken an appeal to the Supreme Court. It is not probable, however, that a decision can be reached for two years, and in the meantime open-hearth metal is iron or steel according to circumstances.

### English and American Pumps.

In our recent remarks upon this subject we have apparently deeply injured the feelings of certain English pump manufacturers. They are, however, very courageous men, and, in a recent number of the *Ironmonger*, attempt to sustain themselves in the assertion that their pumps are as good as those made in America. Like all the other statements which have of late appeared upon this subject, they are mere assertions. Many of them bear upon their face the evidence of their falsity, while others are fabrications of the most execrable kind. Deliberate misstatement in regard to American pumps has been among the very unpleasant features of all that has appeared from the other side of the water. We consider this entirely unjustifiable, even in an attempt to obtain gratuitous advertising. Most of the statements can be seen to be false by the examination of any of the American pump catalogues.

The number of styles of pumps to be had in England is, we judge, very small, for in all the boasts of superiority which have been made only two kinds are mentioned, and both of these are of old patterns. We note such statements as the following: "The 'leading American brands, on the contrary, 'have these parts screwed bodily to the 'pumps'—referring to the top and bottom chambers. This is a false statement, born, we hope, of ignorance, but from the number of times it has been contradicted, we fear that it is a deliberate falsehood. Again, in spite of the statement to the contrary, no American pumps are packed with 'leather strips,' and those who assert this should know better, for one firm has said that they have an assortment of American pumps in their works. After having made this statement, this firm says that they have only two kinds and six sizes in all. In other words, they have the pumps which they bought for patterns, and no more. It is apparent that some of the so-called improvements which they have made are only changes, compelled by want of proper machinery to finish the work in the best manner. If any of these American pumps are packed with 'strips' of leather uncupped, the packing has been done on the other side of the Atlantic. Here pumps are always fitted with cup leathers, and we know of no maker who does not take great care with these leathers.

We find frequent boasts of better iron and lighter castings, and a table is given showing the weight of their pumps to the hundredth of a pound, as compared with half a dozen pumps of two different kinds from one single American house. Upon its face the table bears evidences of having been "cooked." These two styles are gravely put forward as representing American pumps. How honest this is can be easily seen when we say that each of the large pump manufacturers have probably two or three hundred leading styles on their lists, each one of which is made up in five or six sizes. From lists and advertisements which are at hand, we fail to find more than half a dozen styles of hand-pumps by the leading English makers, and from what we can learn, the firm that has made the most noise in regard to pumps has the smallest assortment. They, however, boast that they make "all the pumps sold by the Americans." While they have attempted to copy two styles made by one American house, there are probably not less than 500 styles that are in good demand which they have never yet heard of.

We feel constrained to resent the remark that we have given the English pump manufacturers "personal abuse." To speak sharply when an attempt is made to deceive the public, is proper and right; and when a letter bears internal evidence of willful misrepresentation, we think no one save interested parties will blame us for saying so in language as plain as we can command. We have refrained from using names in this article, as the firm of English pump makers who started and have maintained the controversy, will undoubtedly keep it up so long as they can secure mention in our columns. They are welcome to all the benefit they may have derived from our denunciation of their utter dishonesty of statement, but there is no reason why we should waste space indefinitely for their advantage. If our pump makers have anything to say to them, we will print it with pleasure, but for us to continue the discussion would be to illustrate what Dr. Holmes has happily called "the hydrostatic paradox of controversy."

Trial by jury has the sanction of centuries. It is regarded as one of the safeguards of our liberty, but, like many another institution that has grown venerable, it is in many cases an unmitigated humbug. The principle of trial by a certain number of "good and true" men is unquestionably correct; the application oftentimes is a farce. This has been especially shown in several trials recently in connection with the tariff laws. Here is a class of cases that are intricate and difficult, involving in their correct decision an extended knowledge of facts, many of which are without meaning to the average jurymen; and yet, under our system, these cases, involving in some instances millions of dollars, are submitted to the decision of twelve men, whose first recommendation for the task they have before them is that they are profoundly ignorant of everything connected with it, and have not, and never had, any idea as to what, for example, steel is, or what hoop iron or cotton ties are. With this preliminary and confessed ignorance to fit them for their duty, our twelve men are led into a box, and for hour after hour, sometimes for weeks, they have thrown at them words that have no more meaning to them, in many cases, than so much Chockaw. To have an idea of their significance, if not of their meaning, a special training is needed, and yet so great is our veneration for the jury system that, in spite of the necessity of this special training, we intrust this ignorance with the decision of these most intricate technical questions; and there is no redress, as the juries are judges of fact. Is there not some better way than this? Is it not possible to establish a tribunal for the discussion of these questions that, while it may not be perfect, will certainly be able to judge them more intelligently and fairly than the average jury?

We print elsewhere a letter from the Washburn & Moen Manufacturing Co., with regard to the barb fence wire litigation. It will be read with interest. Referring to our comments on the article from the *Chicago Tribune*, to which reference is made, we fail to find therein anything which has "some appearance of approval." We did say, and we still think, that this popular organization to resist a patent in the courts is interesting, and that the progress of the movement will be watched closely. We said that the farmers consider the royalties demanded of manufacturers too heavy, and as this is why they are taking steps to contest the patent, the fact that they hold this view is obvious. As this is a matter which will be decided in the courts, and not in the newspapers, there is no reason why we should encourage either party to the contest with our approval. A decision in the Supreme Court would end the controversy, and for the benefit of all concerned we heartily wish it could reach that court without delay.

While a very considerable decline is noticed in the export trade, one notable exception must be made in the case of manu-



factured cottons, of which exports since January 1 are beyond all precedent, and must continue through the year, on account of orders already given. By some of the manufacturers' agents further orders cannot be considered. The comparison for a series of years is as follows:

	Packages.	Valued at.
Since January 1, 1881.....	95,274	\$5,484,811
Same time in 1880.....	79,953	5,071,263
Same time in 1879.....	95,564	5,986,471
Same time in 1878.....	79,040	4,915,087
Same time in 1877.....	73,130	5,165,597

The chief demand is for the Chinese market, which would have taken still larger quantities had it been possible to deliver them as promptly as desired. This could not be done, however, as looms at work on the special qualities designed for foreign consumption are fully engaged for the remainder of the year. The home trade does not as yet realize the importance of these demands on the means of supply. These successes are attributed mainly to the reputation that Americans have for dealing in "honest goods."

There is a belief prevalent in Europe, which is not without foundation, that Americans and those who work in America are accustomed to "toil terribly." Not that the work done here is harder or more difficult in itself, but as a young nation, with all our achievements before us, we have not yet reached that stage where we are willing to take things easy. We seek for good results in a short time, and to reach them we are willing to make great present sacrifices. This has often been remarked about our iron mills. The amount of iron some of our trains of rolls turn out is almost past belief to those accustomed to English methods, though there is no doubt Englishmen could do the same if they would; but they do not choose to do so. An intelligent English iron worker who had come to this country with the intention of settling here, lately decided to go back again, and is reported as saying: "I 'wouldn't live here a day. I am a workman and I like to work; but I couldn't stand it here. Why, you men work as 'though-to-morrow was your last day in 'this world, and you had to fill all orders 'before you left.' A large steel manufacturer who has been traveling in this country expressed his astonishment at the way our workmen toiled, and declared that the same men who were working so hard would not work as hard before they left England. He modified his statement, however, by suggesting that the difference in the climate would not let them. Of course it is very pleasant to our vanity to know that in this, as in some other things, we 'beat all creation;' but there may be some doubt if after all it is the best way. Perhaps most of us would accomplish as much if we did not work quite so hard.

We are authoritatively informed that a recent ruling of the Treasury Department with regard to steel blooms, restricts the scope of the decisions of 1867 and 1879 to rail blooms, which were the class of blooms passed upon. Blooms for other purposes than manufacture into rails will be required to pay the 2½ cents per pound duty. This is an important indication of a change in the Treasury policy.

**New Customs Rules in Cuba.**—A gentleman interested in the trade between the United States and Cuba furnishes the following information: "For many years foreign shipmasters trading with Cuba have been subjected to the continual annoyance of fines, imposed by Spanish customs' officials, for alleged informalities in their vessels' manifests. From 1868 to 1874 these fines were so intolerable that other governments were compelled to take notice of them, and the subject was brought to the attention of the government of Spain by a collective remonstrance from the representatives at Madrid of all the principal maritime nations. During those years fines were imposed for very trifling omissions in the manifests, and for reasons which would have been laughable but for the sums extorted from the shipmasters. During the last five or six years there have been less complaints in regard to fines, although the regulations remained unchanged up to June last. In lieu of these fines, however, foreign shipmasters have been subjected, in many ports of the island, to an outside system of petty extortions of officials and interpreters, who, for a douceur, would agree to obtain exemption from fines. Many paid these demands to be rid of the uncertainty of having to pay larger sums at the custom houses when they cleared their vessels. The regulations referred to have recently been superseded by a new set of very complicated and ambiguously worded ordinances, which give customs' officials even a greater power for mischief than formerly, inasmuch as they can, at their pleasure, impose fines ranging from \$10 to \$500, one-half the fines going to themselves; and they claim that there is no authority on the island having power to remit their portion of the fines. Should these new ordinances be enforced to the letter, there is in store for foreign shipmasters visiting Cuba during the coming crop season, a series of annoyances such as they have never before experienced in their intercourse with these custom houses."

The managers of the Matanzas Exposition are still debating the momentous question of whether or not the fair shall be reopened next November, at least long enough to clear it of the debt still unpaid to sundry patriotic capitalists, who advanced the necessary funds for the enterprise, trusting that they would be paid out of the receipts. A balance of \$50,000 is due them. Should the fair not be opened, the sale of buildings and other appurtenances would not realize over \$20,000, so that it is for their interest that the

reopening should take place whenever the weather permits, and a combined effort is to be made to entice foreign exhibitors to attend it, by offering greater inducements than before to all comers.

#### WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., Sept. 2, 1881.

#### REVIVAL OF COTTON MANUFACTURING INDUSTRY IN THE SOUTH.

At the Treasury Department, through the special agents in the South, information has been received that the movement inaugurated with a view to the promotion of the cotton manufacturing industry in that section, is meeting not only with universal approbation and support, but promises to be a great success. The buildings and machinery of mills which were erected years ago, at a time of a similar revival of industrial activity in the South, are being repaired and put in working order, and operations are to begin at once. This enterprising spirit seems to prevail especially in the States of North and South Carolina, Georgia and Alabama. It is reported that the movement is entirely in the hands of Southern men, though the capital is largely from the North. The only difficulty in the way of immediate success, it is reported, will be the securing of the skilled labor required to attend to the delicately constructed and intricate machinery used in spinning and weaving. Agents are now in the North visiting the principal cotton manufacturing centers, to secure a sufficient number of skilled workmen to take direct charge of the machinery and the instruction of young men and women in the different branches. It is a matter of considerable speculation as to what view the middle class of the white population of the South will take of this opportunity for lucrative employment. There has always existed there such an antipathy among the working classes against factory life, a feeling for which the Southern leaders of antebellum days are largely responsible, in their slurs upon that active and industrious class at the North, that some apprehensions are felt on this subject. It is stated that the better class of colored people are taking freely to this new field for the employment of labor, and are apt in learning the duties required of them.

The theory of this industrial revival is that economy of transportation of the raw materials will overbalance other considerations at present, and that the Southern mills will be able to successfully compete with the old establishments of the North in prices, if not in quality, especially in the lower grades of goods. The failures of previous attempts in this same direction are attributed to local institutions, social conditions and popular prejudices, which either do not now exist, or have been greatly modified since the abolition of slave labor, the close of the rebellion, and the imperative necessities which ever since have been so completely revolutionizing public sentiment in the South on economic and social questions.

The extent of cotton manufacture in North Carolina particularly has already assumed noticeable dimensions. The establishments mentioned are in Alamance County, running on full time; in Randolph County, a new mill just completed, and the Randleman, with 8500 spindles and 500 looms. This mill has purchased another site and intends to increase to 10,000 spindles. On the Haw River a large mill is being still further extended, and factories are being erected on the Yadkin River, near the North Carolina Midland Railroad, near Idol's Ferry, at Charlotte and Concord. The Rock Hill Factory, in York County, S. C.; the Balesville Factory, at Greenville, S. C.; the old Nunn Factory, at Autauga, Ga., idle for years, and the Enterprise Factory, at Augusta, Ga., will begin operations in September, employing about 150 hands each. Other factories are contemplated. It is, therefore, evident that the Cotton Exhibition of the South is not a mere show thing to illustrate the industries in that section in that line, but part of a general awakening of a spirit of enterprise which will, if pursued, inevitably result in great good.

#### A REMARKABLE INVENTION.

Much interest has been created in navigation circles of the Navy Department, by the announcement that a mechanic of Philadelphia has invented an improved sounding instrument which does away entirely with the use of lead, rope, wire or any other apparatus hitherto used in indicating depth in the ocean, either for safe navigation or scientific inquiry. Commander Sigbee, who is an authority on soundings and other questions kindred thereto, was sent to Philadelphia to examine this remarkable piece of mechanism, and he returns with very encouraging accounts of the present development of the theory, and favors practical experiments on shipboard, so that the scale, which is all that is wanted to complete it, can be computed and established. This, he says, can only be done by absolute soundings, so as to compare the results of a measurement at given depths with the effect of the same on the instrument, and make the indication. The inventor's name and the details of the instrument are held as a profound secret at the Navy Department for the present. The theory of the instrument is based on the laws of gravitation and attraction, and the instrument is expected to record depths so that they can be read by mere inspection, the same as a thermometer records temperature or a barometer atmospheric pressure.

Among the most notable inventions in this line may be mentioned that of Prof. Siemens, of Germany, who devised a somewhat familiar instrument, called a bathometer; Sir William Thomson, of England, who invented a sounding machine for sounding below 100 fathoms, and another Englishman, named Bassonett, an atmospheric sounder, which could be used equally well while the ship was in motion, and showed by compression of air no matter what the position of the line.

The new instrument is said, by those familiar with the subject, to be far ahead of anything of the kind known to the department, it enabling the navigator to see the

depth by examining the scale, the mechanism being acted upon and influenced by the principles of terrestrial attraction, and indicating whether the bottom of the ocean is far or near. It is conceded that the utilization of such an instrument would revolutionize and simplify navigation so that officers of a ship could instruct the man on deck to give notice when, say, 50 fathoms is indicated, and instead of dropping the lead, this indicator would show the approach to shoal water. The inventor of this wonderful instrument will be given every opportunity for experiments and assistance in making the recording scale.

#### National Convention of Manufacturers to Revise the Tariff.

The committee charged with the preparations for holding a National Convention of Manufacturers, Farmers and Mechanics, to effect a revision of the tariff in furtherance of American industry, have decided to hold said convention in New York City on November 24. The committee consists of the following named gentlemen:

Thurloew Weed, New York.  
Simon Cameron, Harrisburg, Pa.  
Hon. Daniel J. Morrell, president of the Iron and Steel Association.  
Thomas Dolan, president of the Philadelphia Association of Manufacturers of Textile Fabrics.  
Thomas S. Harrison, president of the Manufacturing Chemists' Association of the United States, Philadelphia, Pa.  
Wellington Smith, president of the American Paper Makers' Association, Lee, Mass.  
O. W. Potter, president Western Industrial League, Chicago, Ill.  
A. M. Garland, president National Wool Growers' Association, Springfield, Ill.  
J. Phil. Mackey, secretary Silk Association, Paterson, N. J.  
Benjamin Allen, president Hosiery Manufacturers' Association, Philadelphia, Pa.  
Rufus S. Frost, president National Association of Wool Manufacturers, Boston, Mass.  
James Gillender, president Glass Manufacturers' Association of the United States, Philadelphia, Pa.  
J. H. Brewer, president United States Pottery Association, Trenton, N. J.  
George S. Bowen, president Textile Manufacturers' Association of the West and South, Chicago, Ill.  
Henry Bower, secretary Manufacturing Chemists' Association, Philadelphia, Pa.  
David P. Swearer, president of the Glass Workers of the United States, Pittsburgh, Pa.

James M. Swank, secretary of the Iron and Steel Association.  
William T. Seal, secretary of the Philadelphia Association of Manufacturers of Textile Fabrics.  
Albert Chapman, secretary Vermont Wool Growers' Association, Middlebury, Vt.  
Thomas Maddox, president Potters' Association of Trenton, N. J.  
John Roach, of John Roach & Son, shipbuilders, New York.

Stockton Bates, of the Bridesburg Manufacturing Company, Philadelphia, Pa.  
W. E. C. Cox, of the Montour Iron and Steel Company, Reading, Pa.  
Theodore C. Bates, of the Worcester Corset Company, Worcester, Mass.  
Cyrus Elder, of the Cambria Iron Company, Johnstown, Pa.  
Selden E. Marvin, of Albany and Rensselaer Iron and Steel Company, Troy, N. Y.  
James L. Branson, knitting machine manufacturer, Philadelphia, Pa.  
W. C. Cronmeyer, of United States Tin Plate Company, Pittsburgh, Pa.  
Giles B. Stebbins, lumber, Detroit, Mich.  
D. F. Houston, of the Chester Rolling Mill, Thurlow, Pa.  
Marcus Hanlon, of the American Protectionist, New York.

Oliver Williams, of Catasauqua Manufacturing Company, Pennsylvania.  
P. H. Laufman, of Apollo Iron Company, Pennsylvania.  
Andrew Wheeler, of Morris, Wheeler & Co., Philadelphia, Pa.  
Albert F. Damon, of Pennsylvania Salt Manufacturing Company, Philadelphia, Pa.  
Charles Ridgely, of the Springfield Iron Company, Springfield, Ill.

General S. F. Chalfin and W. H. Dickson, Chester, Pa.  
E. M. Boynton, saw manufacturer, Newburyport, Mass.

Calvin Wells, of the Pittsburgh Forge and Iron Company, Pittsburgh, Pa.  
Thomas Simpson, of the Edgystone Manufacturing Company, Limited, Edgystone, Pa.

William Sellers & Co., Philadelphia, Pa.  
E. N. Bissell, president Merino Sheep Breeders' Association, East Shoreham, Vt.

W. R. Burt, president of the Salt Association of Michigan, East Saginaw, Mich.  
Nevigold, Scheide & Co., Bristol, Pa.

Coatesville Iron Company, Coatesville, Pa.  
Eaton, Cole & Burnham Co., New York.  
Wm. McIlvaine & Sons, Reading, Pa.

St. Louis Stamping Company, St. Louis, Mo.  
Fiss, Banes, Erben & Co., Philadelphia, Pa.

Conyrs, Button & Co., Philadelphia, Pa.  
Joseph A. Whittier, president Board of Trade, East Saginaw, Mich.

Carmichael & Emmons, New York.  
Burnham, Parry, Williams & Co., Baldwin Locomotive Works, Philadelphia, Pa.

F. O. Horstmann, of Wm. Horstmann & Son, Philadelphia and New York.  
Wm. A. Gellatly, of W. H. Schieffelin & Co., New York.

The following sub-committee of management was appointed to select a time and place for the convention: C. F. Houston, Henry Bower, Cyrus Elder, J. H. Brewer, F. O. Horstmann, Thomas Dolan, Marcus Hanlon, James M. Swank and James Gillender. After careful deliberation the decision reached is announced, as above. The committee are also charged with the duty of deciding what business shall be brought before the convention for its action. The deliberations of the committee have proceeded noiselessly, attracting little of public attention, but are none the less effective on this account, and the character and business standing of the gentlemen directly concerned

are such as to give the strongest assurance of salutary results. All the great manufacturing interests are represented—iron, steel and glass of course having due prominence—and the members of the committee are from a wide territory, comprising the Middle and Eastern States, and points as far West as Michigan, securing for this movement a national character. The body of the convention itself will doubtless include many from remote sections. It is suggested that among the topics to be discussed are: 1st, A revision of the tariff in the interest of American labor. 2d, A review of industries that are destroyed or greatly injured by foreign competition, because of erroneous Treasury rulings or defective laws. 3d, The abolition of internal taxes, wholly or in part, and 4th, American ships.

Henry Carey Baird, of Philadelphia; Congressmen McKinley, of Ohio, and Kelley, of Pennsylvania, are spoken of among those who may be expected to deliver addresses.

It is understood that further announcements will be made at a meeting of the Executive Committee, to be held at the St. Nicholas Hotel on the 13th inst. The convention will probably be held at the Cooper Union building.

#### "The Barb Fence Litigation."

To the Editor of The Iron Age.—In a recent issue of your paper you copy, and comment upon, with some appearance of approval, an article from a Western newspaper on the above subject. We certainly belong to a class for whom the *Iron Age* and its positions on industrial affairs have special value. The main question involved in the Iowa controversy in its present shape, is the rights of inventors and their assigns under our patent system. Barb fencing was utterly unknown to the public eight years ago. For the first two or three seasons after its introduction it was bitterly opposed, as absurd in principle and harmful in results. The perfection of barb fencing involved a large number of patents, including not only the first idea of a sharp, repellent barb, but calling for new and complicated machinery for making barbed wire. Then, as has been the case with nearly all valuable patents, there followed an expensive, far-reaching and protracted controversy in the courts.

Now, what class of readers of *The Iron Age*, whether mechanics, working out their inventions in spare hours; or capitalists, through whose co-operation all invention must come to success; or the public, as general beneficiaries of our patent system, will fail to find each their own advantage and encouragement in the fresh proofs that the really meritorious invention can be advanced to perfection, and its rights successfully defended in the courts, if it is found to be an article of utility and value.

With these plain facts long ago established, and now simply reaffirmed in the case of barb fencing, it is to-day really a question to be discussed by honest men and fair-minded newspapers, as to how cheaply barb fence wire can be made by any one who, disregarding the rights under these barb fence patents, and taking free advantage of all the development already reached, has only to study the cost of metals and rates of labor.

The "life of a patent" is intended to give a reasonable period for the successful inventor, and those who hold rights under him, to reap their joint rewards, and recompense those outlays and ventures the perfection, introduction, and defense of patents require. Without the assurances of such reward, what patent would, or could, ever be brought to success? Is not this the design and meaning of our patent system?

Having thus sought to show that the inventor and those who enable him to realize success are entitled to the extra rewards our patent system holds out, it is now pertinent that we answer the salient objection suggested in your article above referred to. The truth is, that, mainly through the efforts of this company, by the introduction of automatic machinery, the price of barb fencing to the farmer has been, during the last years, reduced from 18 to 3½ cents per pound; moreover, the actual difference between the cost of barb fencing and the price at which it is to-day furnished, promptly and in any quantity, to the farmers of the country, is not to exceed 2 cents per pound. Out of this meager margin is to be paid the inventors of the various patents covering styles and machinery used in manufacturing barb fencing; the manufacturer's profit, who supplies the smooth wire; the jobber who orders the fencing in large quantities, runs all the risks of trade, incurs the expense of storing and of distributing by the means of his salesmen throughout the country, and the expense and profit of the retailer.

We assert, from our own knowledge, that no patented article, conceded to be of prime necessity, has ever been offered at so small a profit for each and every class through whose hands it must pass, as is the case with the article of steel-barb fencing.

WASHBURN & MOEN MFG. CO.  
WORCESTER, MASS., AUG. 31, 1881.

The *Utica Herald* takes the following philosophical view of the growing smoke nuisance in that city: Instead of being detrimental to health, the smoke that has been in the air the last few days is really beneficial. The more one breathes of it the better, up to a reasonable point. The creosote which has been taken into the lungs, and through them carried into the blood, since the murky season set in, is as good as a course of treatment by a physician. People who had toothache a week ago ought to be over their trouble by this time. Creosote, as its name implies, is a preserver of flesh. It is by virtue of this property that smoke preserves hams and other meats that are subjected to its influence. If the weather of the last few days should continue long enough, the people now living would stand a chance of being preserved as permanently as the mummies that have just been discovered in Egypt. Creosote forms the base of a very large part of the medicine which people take when the doctor prescribes for

them. It is good for hemorrhage, diarrhea, cholera morbus, cholera infantum, nausea, vomiting, toothache and a variety of other ailments. No one can say that the visitation of smoke at this time is not intended as an antidote for some disease that would be disastrous. It may save many people from cholera morbus, brought on by over-eating of water melons and half-ripened fruit. Children especially might with beneficial effect be kept out of doors while the smoke lasts.

#### The St. Louis River Convention.

The people of St. Louis and of the river regions contiguous, are as deeply impressed as ever with a sense of the grandeur of their coming destiny. They believe that no small proportion of the interior traffic of this continent, will eventually seek the channel of the Mississippi River, and estimate that in the export trade already one-seventh of the vast production of this region goes that way to the sea. Therefore they propose to hold a convention in St. Louis October 26, and have issued a call for this purpose, said convention "to be composed of delegates from the States and Territories of the Mississippi Valley, the Governors being hereby authorized and requested to appoint ten from each State and five from each Territory."

The President and Vice-President of the United States, members of the Cabinet, Senators and Representatives in Congress, and Governors of States and Territories will be invited as guests of the convention, and assigned seats on the floor during its deliberations. The object of the convention appears more definitely from the text of the "call," which says:

The rapid growth and settlement of the Mississippi Valley, and with it the development and enlargement of the export trade, a trade made up in largely controlling proportions of its products, has forced upon the thought of the country the question of cheap transportation. All the later commercial and trade experiences have demonstrated that only by the cheap water route can this question be so placed as in its resultant influences to represent and embrace fair profit to the farmer, the manufacturer and the merchant, the classes through which all others become participant in the profits of industry. The necessity of improving these navigable streams and the correlative duty of the general government to give its aid as to a great national work, is derived from a consideration of their functions in the commerce and trade of the country. Within the area of States and Territories drained by the Mississippi and its navigable tributaries is produced 90 per cent. of the corn, 73 per cent. of the wheat, 83 per cent. of the oats, 64 per cent. of the tobacco, 77 per cent. of the cotton and 66 per cent. of the value of the live hogs of the whole country. In addition to the vast supply of food and textile products, the abundance of coal, iron and timber, mark it as the seat of manufacturing industries, the great and unquestioned source of American production and national revenue. Even in the present imperfect conditions of navigation, one-seventh of the amount of this vast production which enters into the export trade of the country goes to the ocean by the way of the Mississippi River, at a cost less than one-third at which it can be carried by any other route.

**The Life of Iron Ships.**—The *London Globe* says: What term of years may be calculated as the life of a substantially constructed iron ship? Experts, we believe, are still undecided on that head, but, judging from what is reported about the Great Britain, a vessel of this sort is quite as long-lived as a man, accidents apart. That once famous steamship left the stocks at Bristol nearly 40 years ago, and when she was put up to auction at Liverpool the other day she was found to be almost as strong as ever. A very notable career hers has been, since the world marveled at Mr. Brunel's audacity in designing such a monstrous craft. Gigantic, indeed, she seemed in those days, but we have moved on so quickly since then that the Great Britain has come to be quite a moderate-sized vessel for ocean voyages, her dimensions being only 1795 tons register, or 3270 burden. During her early lifetime she met with a series of misfortunes, the first being of a rather comical sort. Before she could reach the river Avon from the yard where she was built, the glory of Bristol had to pass through the lock-gates of Cumberland Basin. Nor was it until she had nearly got wedged in the exit that her proprietors discovered her to be some feet too broad to pass through. After that she lay for a whole winter fast aground in Durdram Bay, with nothing to protect her against the fury of the waves but the floating breakwater of brushwood and faggots which Capt. Claxton thought of in a moment of inspiration. The Great Britain subsequently suffered many other vicissitudes, and the public will therefore be glad to hear that the old ship is in such good health.

Among the many branches of business which have recently received an impulse, is the manufacture of emery and the various tools and forms by which it is rendered effective. For a long time the business, like many others, has been done almost without profit to the manufacturer. The increased amount of ironwork in the work of machinery, stores, etc., has greatly increased the consumption of this article, which is essential in all sorts of iron finishing. The emery factories are busy to their fullest extent, and it is with difficulty that the supply can be kept up. The natural result is an advance in the price of the article to the extent of about 10 per cent. Manufacturers, however, say that even the present price is lower than it should be for reasonable profits.

The New York Steam Heating and Power Company, W. C. Andrews, president, and Chas. E. Emery, chief engineer, have commenced the erection of a building in Greenwich street, near Cortlandt, which gives promise of great strength and permanence. Superheated steam will be distributed in pipes laid underground, for the purposes indicated by the name of the association.



# DUNNING FINISHED STEEL HORSE SHOES.

The most popular Horse Shoe in the world. Will outwear three Iron Shoes.

Dunning Steel Finished Horse Shoes may be ordered in any quantity, packed, assorted sizes to suit, from the following hardware houses:

SIMMONS HARDWARE CO., St. Louis.

HIBBARD, SPENCER & CO., Chicago.

S. D. KIMBARK, Chicago.

JONES & LAUGHLIN, Chicago.

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H. KAHLO & CO., Toledo.

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COOMBS & CO., Fort Wayne.

GEORGE TRITCH, Denver.

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B. D. WEST & ROSE,

97 Liberty St., New York.

LOCKE, HALE & CO.,

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Send for sample keg, assorted sizes. Full descriptive catalogues sent on application. Manufactured exclusively by

**THE CHICAGO STEEL HORSE SHOE CO., Chicago, Ills., U. S. A.**  
FACTORY AT PULLMAN (NEAR CHICAGO), ILLS.



Are forged from a solid bar of steel. Afford a firm level bearing, thereby securing to the horse the most natural position for comfort and speed. Is a self-cleaning shoe, and will not "ball up." Equally good for summer or winter use. Will prevent horses from "calking" or growing corns. Can be resharpened as readily as an iron shoe.

## OPINIONS.

I do not hesitate to give it as my opinion that it combines more excellences than any I have before seen. It provides a solid base under all circumstances, for the horse while standing or traveling; has no rocking motion while the animal is turning, and possesses eleven calks to protect him from falling. I have never seen the inventor of this improvement, but I desire, in the interest of the noblest animal living, to thus thank him for the good his shoe is likely to bring him.

HENRY BERGH,  
President the American Society for Prevention of Cruelty to Animals, New York.

OFFICE OF NORTH CHICAGO CITY R. R. CO.,  
Chicago, Feb. 16, 1881.

CHICAGO STEEL HORSE SHOE CO.—GENTS: We are using your "Dunning Steel Horse Shoe" on our car horses, and find they last us from three to four months before being worn out. We drive our horses about 16 miles a day—half over cobble stones and balance pavement. We consider them the best shoe made.

M. W. SQUIRES, Supt.

Nos. 56 to 68 W. VAN BUREN ST.,  
Chicago, Feb. 16, 1881.

CHICAGO STEEL HORSE SHOE CO.—GENTS: I have used the Dunning Steel Shoe on my horses with great satisfaction. I regard it as the most practical and valuable improvement yet made in Horse Shoes. I am sure they will commend themselves to owners and shoers.

A. W. KINGSLAND,  
Secretary Northwestern Horse Nail Co.



PAWTUCKET, R. I.,

MANUFACTURERS OF

# FILES AND RASPS.

ESTABLISHED 1863.

Capacity 1000 dozen per day.

GOODS WARRANTED TO GIVE SATISFACTION.

**NEWTON'S PATENT STEAM TRAP AND GRATE BARS,**

MANUFACTURED BY

**PROVIDENCE STEAM TRAP CO., Providence, R. I.**

See The Iron Age first issue of each month.

Agents Wanted for Different Locations.



WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

**WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.**

**HARVEY W. PEACE, VULCAN SAW WORKS**  
BROOKLYN, E. D., N. Y.,

Manufacturer of First Quality

**HAND, PANEL, AND RIP SAWS,**

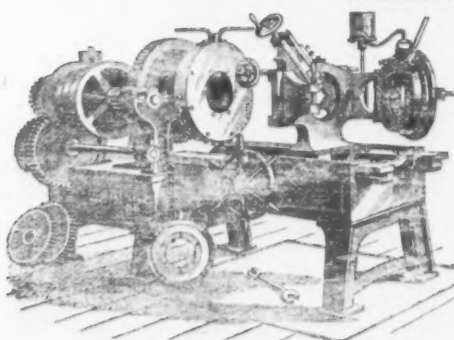
AND KINDRED GOODS;

Also, MILL, CROSS-CUT AND CIRCULAR SAWS.

**BAND SAWS A SPECIALTY.**

**D. SAUNDERS' SONS,**

Manufacturers of



Pipe Cutting & Threading Machines,  
For Pipe Mill and Steam Fitters' Use.

**TAPPING MACHINES,**  
For Steam Fitting.

ALSO.

Steam & Gas Fitters' Hand Tools.  
**YONKERS, N. Y.**

Send for Circulars.

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BOSTON, MASS.

**THE BEST "NUT TAPPING MACHINE"**  
LATEST IMPROVEMENTS. PURDY MACHINE CO.

# UNITED STATES SMELTING WORKS,

MANUFACTURERS OF



# BABBITT AND TYPE METALS,

Brass Castings and Solders of all Kinds.

PIC AND BAR TIN.

PIC AND BAR LEAD.

Pig Brass and Copper, Spelter, Antimony, &c.

1615 & 1617 Spring Garden Street,

PHILADELPHIA.

GEORGE HUNT,

M. S. STOKES.

Gentlemen.—This cut illustrates our

**CAST IRON**

# Furnace Lamps

which are superceding entirely the Tin Lamps wherever introduced, in consequence of their durability. They are now extensively used in the Iron Districts of Ohio and some in Pennsylvania. We call your attention to and solicit your order for them, confidently asserting that they are an A No. 1 article in every respect.



Sample sent if desired.  
PRICE, \$12 PER DOZEN.

**Taylor & Boggis,**  
CLEVELAND, O.

# COVERT MFG. CO.,

SOLE MANUFACTURERS OF



**COVERT'S**

# PATENT HARNESS SNAPS,

Chain and Rope Goods.

These goods are sold by all leading jobbers in General and Saddlery Hardware at manufacturers' prices.

Send for illustrated catalogue and price list.

**COVERT MANUFACTURING COMPANY,**  
WEST TROY, N. Y.

**THE AMERICAN MACHINE CO.,**

MANUFACTURERS OF

# HARDWARE SPECIALTIES.

Office and Factory: Lehigh Ave. and American St., Philadelphia. Branch House: No. 128 Chambers St., New York.  
SPECIALTIES: Fluting Machines, Hand Fluters, Plating Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.



# LIGHTNING HAY KNIVES.

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

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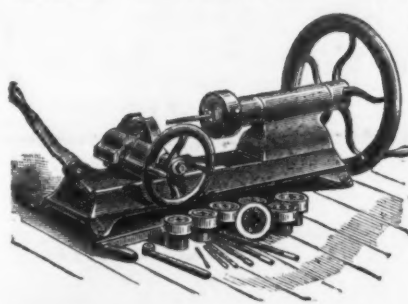
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East Wilton, Franklin Co., Maine.

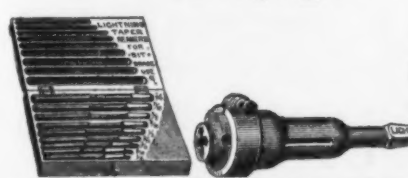
For sale by the Hardware Trade generally.

## WILEY & RUSSELL MFG. CO., Greenfield, Mass.

Lightning Screw Cutting Machinery and Tools.



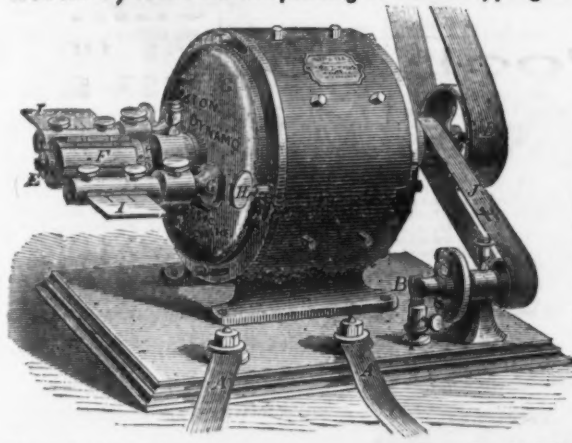
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Screw Plates, cutting from wire sizes to 1 1/2 inch.  
Lightning Taps, Dies and Reamers for use in the Bit Brace.  
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Tire Benders.  
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Tire Wheels, Tire Bolt Wrenches, &c.  
Send for Illustrated Price List.



HANSON & VAN WINKLE, Sole Agents for

Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.

For Nickel, Bronze, Brass, Copper and Silver Plating.  
Over 1000 machines in use.  
Are used by all leading stove manufacturers.  
Experienced men sent to put up machines and instruct purchasers.



**INFRINGEMENTS.**  
We call attention to infringements of the Weston Machine in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

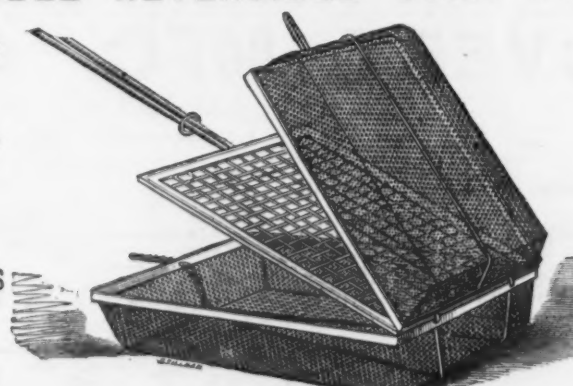
MANUFACTURERS OF  
Cast Nickel Anodes, Pure Nickel Salts, Polishing Materials.

Manufactory, Newark, N. J.

New York Office, 92 and 94 Liberty St.

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OUTSELLS  
ALL  
OTHERS.  
Close  
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TO  
Jobbers.



Double  
The Size  
OF  
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Poppers.  
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25 Cents.

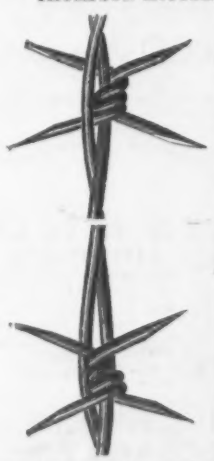
Wood Patent, April 14, 1874.  
Made of Plated Wire. Durable and Handsome.

**BROMWELL MANUFACTURING CO.,** Sole Makers, Cincinnati.

Agents: **W. H. QUINN & CO.,** 79 Chambers Street, New York.

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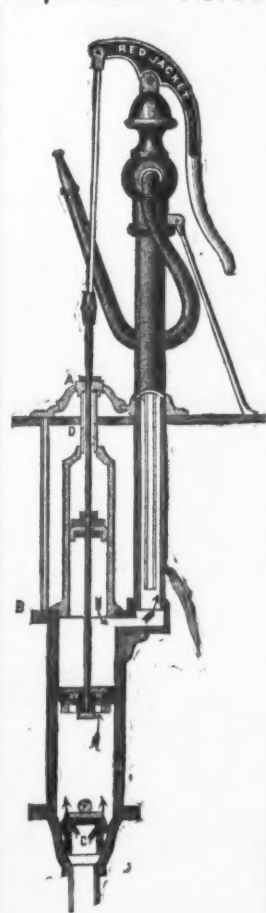
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## THE COMBINATION

IRON CLAD STEEL HORSE SHOE CO.,  
SELF WELDING STEEL TIRE CO.,  
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BOSTON, MASS.  
Sole and exclusive manufacturers of "Wheeler's Combination" Shoes, Shot Bars and Toe Calks. Tire and Wire. Full particulars upon application by mail or otherwise to WARE B. GAY, Treasurer, 66 State Street, Boston, Mass. All persons cautioned against infringements.

## Martin's Celebrated RED JACKET Adjustable Force Pumps.



This pump represents the only Double-Acting Force Pump, adaptable to any well or cistern and for all purposes of raising water. It is made of cast iron, and is of the most reliable and durable construction. It will throw water 50 or 60 feet with ease. Any lady or child can pump them. Thousands now in satisfactory use in wells and cisterns to a depth of 100 feet. No stuffing boxes to leak and keep packed; are either for hand or foot power, and adapted to wind mill or hand power; are the best drive well pumps in America. Patents secured in all countries. For descriptive circular, price list and full particulars, address  
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## The Iron-Masters' LABORATORY.

Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestones, Clays, Slags and Coal for Practical Metallurgical Purposes.  
No. 339 Walnut St., Philadelphia.  
With Branch at Warrenton, Virginia.  
**J. BLODGET BRITTON.**

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.	
For determining the per cent. of Pure Iron in an ordinary Ore.....	\$4.00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do.....	12.50
For each additional constituent of usual occurrence.....	1.50
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For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone.....	10.00
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For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an Ore.	
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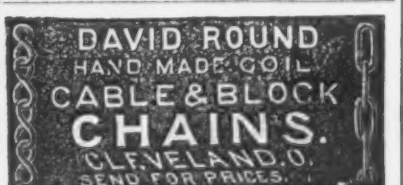
## TISCHER'S JACK.

From 5 to 30 Tons.  
No Repairs, Packing or Alcohol.  
NEVER RUNS DOWN  
UNDER THE LOAD.  
Handier, stronger, longer lived and cheaper than any hydraulic jack.

**GEO. A. OHL & CO.,**  
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## THE "EDDY" STRAIGHTWAY VALVES.

ALSO,  
FIRE HYDRANTS.  
Axe, Hatchet, Powder and Brush Machinery.  
**MOHAWK & HUDSON MFG. CO.,**  
WATERFORD, N. Y.  
BENTON, FAULKNER & BIRD, N. Y. Agents.  
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## BLACKSMITHS' FORGES

(Patterson's Patent).  
Portable or stationary, superior to stone or brick. Can be used with bellows or fan. Send for information to the  
**FORGE COMPANY,**  
Brooklyn, E. D., N. Y.

## Recent Trade Mark Enactments.\*

**Connecticut.**—"An act concerning trade marks" was approved March 25, 1880. It provides that any person entitled to the exclusive use of any lawful trade-mark, or who intends to adopt and use a lawful trade-mark, may file for record such trade-mark in the office of the Secretary of that State in form prescribed by the act. That false swearing in the proceedings shall be perjury, and that the Secretary of State may refuse to record the mark filed if he believes the statement accompanying it to be untrue. A mandamus is allowed to compel the recording. "Every party having the lawful right to make and file such certificate and affidavit, upon the recording of the same in said office, shall become entitled to the exclusive use of the trade-mark therein described, for so long as he or his assigns shall continue to be engaged in the manufacture or sale of the merchandise or description of goods to which it is appropriated." Right assignable in writing. Copies of record, with certificate of Secretary of State under the seal of the State, *prima facie* evidence of title. Infringer of recorded trade-mark with knowledge of record shall pay to owner double damages, and such sum in addition thereto (not exceeding \$500) as the Court may order to be added. Rights to any existing trade-mark not abridged by this act. "§ 8. Every person who fraudulently and with intent to deceive, affixes any trade-mark recorded under this act, or any such imitation thereof as is calculated to deceive, to any goods, receptacle or package similar in descriptive properties to those to which such trade-mark is appropriated; or who fraudulently and with intent to deceive places in any receptacle or package to which is lawfully affixed a recorded trade-mark, goods other than those which said trade-mark is designed and appropriated to protect; or who fraudulently and with intent to deceive, deals in or keeps for sale any goods with a trade-mark fraudulently affixed, as above described in this section; or any other goods contained in any package or receptacle having a lawful trade-mark, but not being such goods as said trade-mark was designed and appropriated to protect, shall be fined not more than \$500 or imprisoned not more than 50 days, or both."

**Delaware.**—"In 1850 an act was passed entitled 'An act for the protection of manufacturers and vendors of mineral waters, porter, ale and other beverages in bottles.' This was amended in 1861, and re-enacted in 1879 (Chap. 92). It provides for the filing by vendors of such beverages of their marks in the office of the Secretary of State, and publication for six weeks in a newspaper of the county where the same are manufactured and sold. The person refilling or trafficking in, without the consent of the owner, bottles, &c., bearing marks so filed and published, is liable to a penalty of 50 cents for every bottle for first offense, and \$5 for every subsequent offense. (§ 3.) "That the fact of any person, other than the rightful owner thereof, using any such bottles for the sale therein of any beverages shall be *prima facie* proof of the unlawful use or purchase of such bottles as aforesaid." The issue of a search warrant, to discover alleged wrongfully used bottles, is provided for in language similar to that of the New York statute. (See New York, § 371 post.)

**Montana.**—"The Legislative Assembly, in 1860, provided for the registration of marks for animals, and punishment for wrongful use or destruction of marks (ordered published, laws of 1870, p 58), and also of counterfeiting of trade-marks (Crim. Pr. Act, Chap. 7, Sec. 70). "That every person who shall knowingly and willfully forge or counterfeit, or cause or procure to be forged or counterfeited, upon any goods, wares or merchandise, the private stamps or labels of any mechanic or manufacturer, with intent to defraud the purchasers or manufacturers of any goods, wares or merchandise whatsoever, shall, on conviction thereof, be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail for a term not exceeding six months, or by a fine not less than \$300 nor more than \$600."

"§ 80. That any person who shall sell any goods, wares or merchandise, having thereon any forged or counterfeited stamps or labels, purporting to be stamps or labels of any mechanic or manufacturer, knowing the same to be forged or counterfeited, without disclosing the fact to the purchaser, shall, on conviction thereof, be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail for a term not exceeding six months, or by a fine not less than \$300 nor more than \$600."

This was followed in 1874 by "An act in relation to trade-marks and brands," which provided that any person who desired the exclusive use within the territory of any name, mark, brand, print, designation or description for any article of manufacture or trade, or for any mill, hotel, factory, machine shop or other business, shall register such mark, &c. (if it has not been previously registered), and thereafter the registrants shall have the exclusive right to use said mark. Figures, letters or Roman numerals not protected as marks. Any person who shall use a registered mark for the purpose of deception and profit is guilty of a misdemeanor. Penalty, fine from \$100 to \$1000.

Any who shall use a second-hand sack, box, &c., on which has been placed the name, mark, &c., the property of another, for the purpose of deception, is guilty of a misdemeanor. Penalty as above.

Fee of Recorder, \$1. Powers of courts of equity to enjoin improper use of trade-mark, &c., excepted from provisions of act. All fines under act to go to school fund. All acts in conflict repealed.

**Mississippi.**—"In 1880 'The Revised Code' of the statute laws was adopted. § 2831 reads: "Every person who shall knowingly and willfully forge or counterfeit, or cause or procure to be forged or counterfeited, any representation, likeness, similitude, copy or imitation of the private stamps, wrappers or labels usually affixed by any mechanic or manufacturer to, and used by such mechanic or manufacturer on, in or about the sale of

any goods, wares or merchandise whatsoever, upon conviction thereof shall be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail for a term not less than three months, nor more than two years."

§ 2842: "Every person who shall have in his possession any die, plate, engraving or printed label, stamp or wrapper, or any representation, likeness, similitude, copy or imitation of the private stamp, wrapper or label usually fixed by any mechanic or manufacturer to, and used by such mechanic or manufacturer on, in or about the sale of any goods, wares or merchandise, with intent to use or sell the said die, plate or engraving, or printed stamp, label or wrapper, for the purpose of aiding or assisting in any way whatever in vending any goods, wares or merchandise, in imitation of, or intended to resemble and be sold for, the goods, wares or merchandise of such mechanic or manufacturer, shall, upon conviction thereof, be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail for a term not less than three months, nor more than one year."

§ 2843: "Every person who shall vend any goods, wares or merchandise having thereon any forged or counterfeit stamp or label, imitating, resembling or purporting to be the stamp or label of any mechanic or manufacturer, knowing the same to be forged or counterfeited, and resembling or purporting to be imitations of the stamps or labels of such mechanic or manufacturer, without disclosing the fact to the purchaser thereof, shall, upon conviction, be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail for a term not exceeding one year, and by a fine, not less than fifty nor more than five hundred dollars, or by both such fine and imprisonment."

**Nebraska.**—"The law of Nebraska, digested at p. 7, is contained in the criminal code under the head of forgery, and is included with records, deeds, wills, &c. Sections 137, 138 and 139 of the criminal code also provide (§ 137) that sugar, rice, tobacco, soap, starch, candles, cheese, or any goods or articles sold by weight packed in kegs, barrels, tierces, casks, boxes, hogheads, or any case whatever, such kegs, &c., shall be marked with the weights both of the package and the contents. It also provides (§ 138) that "any brand, mark or stamp put upon any keg, barrel, box, cask, hoghead or case by the manufacturer indicating the article, its quality, quantity, or the manufacturer's name, or either of them, shall be considered the manufacturer's certified brand, stamp or mark." &c., "which shall be subject to no erasure or obliteration." Nor shall it be transferred for the purpose of refilling for the purpose of selling an inferior article.

Penalty (§ 139)—The party violating provisions of above sections "shall in all cases pay to the party aggrieved double in value of the difference between the actual quantity contained in such keg," &c., "and the net quantity or weight for which the same may have been sold;" and for the first offense be subject to a fine of \$20 to \$60, or imprisonment in county jail 30 to 60 days. Second and subsequent offenses—fine, \$50 to \$100, or imprisonment 30 to 90 days. (Amended, 1875.)

**New Jersey.**—"March 11, 1881, 'An act for the better protection of manufacturers and bottlers of, and dealers in mineral waters, beer, ale, porter and other beverages,' was approved. It recites that manufacturers and bottlers may file in County Clerk's Office description of boxes or bottles and marks thereon, and may publish same for four weeks in newspapers of county. It is made unlawful to use, sell, buy, &c., any boxes or bottles marked or stamped and registered and published. Penalty for so doing not less than \$25 or more than \$50. It says: "That the fact of any person or persons other than the rightful owner or owners thereof using such box or boxes, bottle or bottles, for the sale therein of any mineral water, beer, ale, porter or beverage, or any junk vender, or dealer in bottles having secreted in or upon his, her or their premises, or any other place or places, or having in his, her or their possession unlawfully any of such boxes or bottles, shall be *prima facie* proof of the unlawful use and purchase of such box or boxes, bottle or bottles, as aforesaid."

Owners, upon belief, may make complaint of the unlawful use, &c., of their boxes or bottles before any justice. Magistrate to issue process or search warrant to bring the property or person before him. Offender to enter into recognizance in \$100 to appear at such time as the justice shall appoint for a hearing, and in default of recognizance to be committed to jail to abide the hearing. If found guilty, the justice shall render judgment against the person arrested for an amount not less than \$25, or more than \$50, and costs of proceeding, and in default of payment shall issue execution against the offender and deliver bottles and boxes into the possession of the owner.

If no person is found by constable, the boxes and bottles may be seized and delivered to the owner after summary trial.

Parties may demand trial by jury. Appeals may be had to general quarter sessions.

**New York.**—"The new penal code, which by its terms will become a law on the first day of May 1882, contains the following sections in relation to trade-marks. Title XI.

Section 364.—A person who, in a case where provision for the punishment of the offense is not otherwise specially made by statute, with intent to defraud;

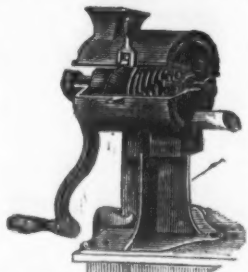
1. Falsely makes or counterfeits a trade-mark; or
  2. Affixes to any article of merchandise, a false or counterfeit trade-mark, knowing the same to be false or counterfeit, or the genuine trade-mark of another, without the latter's consent; or
  3. Sells, or keeps or offers for sale, goods to which is affixed a false or counterfeit trade-mark, or an imitation of a trade-mark, or the genuine trade-mark of another, without the latter's consent; or
  4. Has in his possession a counterfeit trade-mark, knowing it to be counterfeit, or a die, plate, brand, or other thing for the purpose of falsely making or counterfeiting, or causing to be counterfeited, a trade-mark; is guilty of a misdemeanor.
- Sec. 365.—The term "article of mer-

\* Prepared by Francis Forbes, Counselor at Law for the United States Trade Mark Association. For statutes prior to 1879 see *The Iron Age* of Dec. 11, 1879; Dec. 18, 1879; Dec. 25, 1879; April 26, 1880; May 6, 1880; May 13, 1880; May 20, 1880; June 10, 1880.



**Kieser's Gem. Kieser's No. 55**

Double  
Shearing  
Cut.  
Solid  
Cast  
Steel  
Blades.



Are Made on the Same Principle as  
the Gem Meat Cutters,

But with capacity to cut 100 pounds  
Pork an hour.

Patented Sept. 14, 1886.  
**Family Meat Cutters are the best made.**  
Every family should have one. Will thoroughly  
cut Raw or Cooked Beef or Pork, Vegetables, Co-  
conuts, Pine Apples, &c. Will cut forty pounds  
sausage meat an hour.  
Every Druggist should have one for cutting  
Roots, Vanilla Beans, &c.  
Easily worked. Easily cleaned. Will not get  
out of order. Ask your dealer for them.  
Send a postal for Circular with testimonials.  
Will send one as sample by express upon receipt  
of \$2.00.

Will send one as sample upon receipt of \$2.00.  
Our No. 1 Butcher, for hand or power, will  
cut 300 pounds an hour.  
Our No. A Butcher for power, will cut 1000  
pounds an hour.  
We warrant our Cutters to do the work more  
thoroughly than any other machine made.

Also Sole Manufacturers of

**KIMBALL'S PATENT SHOVELS & SPADES,  
BOSS PATENT MOLASSES GATES,  
LOCKWOOD'S PATENT HOES.**

**KIMBALL SHOVEL CO.,**

Office, No. 67 German St., Baltimore, Md.

**THE TURNER & SEYMOUR MFG. CO.**

WOLCOTTVILLE, CONN.,  
MANUFACTURERS OF

Upholsterers', Stationers', House Furnishing & Fancy  
**HARDWARE AND NOTIONS.**



The Turner and Seymour Mfg. Co. have been longer in the  
business and make a greater variety of Cast Iron Scissors  
and Shears than any other concern in the world. Our

**"AMERICAN" SHEARS**

have long been conceded to be the best ever made. The quality  
and finish of these goods shall always be maintained.

To meet the demand for a cheaper line we offer the trade our

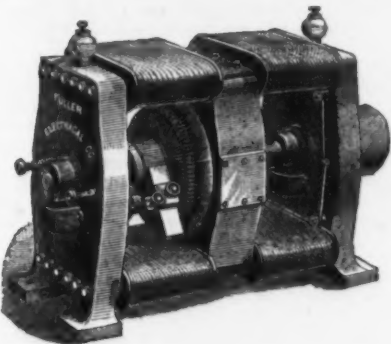
**"CLIPPER" SHEARS.**

On these we cannot be undersold. Price is about 25 per cent. less  
than the "American."

We are now making a fine line of cheap

Nickel Plated Scissors and Shears, Nut Picks,  
Nut Crackers, Fruit Knives &c.

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**THE FULLER ELECTRICAL COM-  
PANY**, having perfected their system of Electric  
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Gramme Dynamo Electric Machines  
and Electric Lamps, either for single lights  
or for from 2 to 20 lights in one circuit.  
This apparatus is unequalled for durability,  
steadiness of light and economy of power,  
and requires less attention than any  
other.

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**SIMPSON & GAULT (PEERLESS WRINGER CO.),**

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**PEERLESS**

**CLOTHES WRINGERS.**

Sold by the Jobbing Trade everywhere. Most Saleable Wringer in the market.

MR. L. F. BLUE, who has been in our employ for a great many years, is our SOLE AGENT, and  
will visit the jobbing trade throughout the United States.

**STATIONARY AND PORTABLE  
STEAM ENGINES,**  
Shafting, Hangers, Pulleys and Gearing.

**SAW MILLS,**  
Hoisting Engines and Mining Machinery.

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Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St.  
NEW YORK, 67 Beckman St. CHICAGO, 182 Lake St.

**J. STEVENS & CO.,**

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**SPRING CALIPERS AND DIVIDERS**

Also, Surface Gauges and Counter Sinks, Stevens' Patent  
Breach-Loading Sporting Rifles, double and single barrel; Shot  
Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet  
Rifles. Our

**SHOOTING GALLERY RIFLE**

Is the favorite everywhere.

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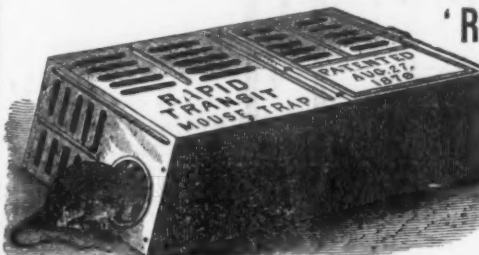
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Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

**DEOXIDIZED BRONZE,**

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

PHILADELPHIA, October 4, 1890. GENTLEMEN: After a trial of eighteen months of your  
"Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we  
take pleasure in recommending it as being superior to any we have heretofore used.  
Very truly,  
HENRY DRISTON & SONS.



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Iron, Steel, Copper, Brass, Zinc and other metals  
punched to any size and thickness, for all uses.

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Special discounts to the trade. Correspondence  
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**TOOL CHESTS OF ALL SIZES.**  
Adapted for the use of Boys, Youths, Gentlemen, Farm-  
ers, Planners, Carpenters, Hairdressers and Miners;  
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suited to the wants of the Hardware, Toy, Station and  
Variety trades. Export trade solicited, and a full stock  
of large-sized Chests always on hand. Quality con-  
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cheapest that have yet been offered by any manufacturer in  
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Manufacturers of Bailey's Patent Adjustable Planes.  
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**Bradley's Cushioned Helve Hammer**

Awarded first premium, Silver Medal, at American Institute Fair,  
1873; Cincinnati Industrial Exposition, 1874; and 1886, and the Diploma  
of Honor and Grand Medal of Merit at the Centennial Exhibition in  
1876, being the highest award given any goods of their class in Amer-  
ica or Europe. It has more good points, does more and better work,  
takes less power, costs less for repairs, than any Hammer in the  
world. Guaranteed as represented. Established 1853.

BRANCH OFFICE,  
46 & 48 West Lake St.,  
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**BRADLEY & COMPANY, Syracuse, N. Y.**

**JACK SCREWS,**

Press Screws, &c.

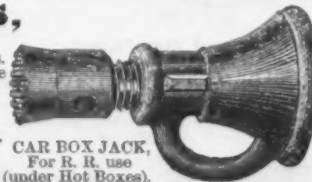
Cast with Perfect Seamless Thread by our new patent process.  
Cheaper than Wrought Iron, not so apt to bend or strip the  
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MANUFACTURERS OF MANILA, SISAL AND TARRED

**CORDAGE OF ALL KINDS.**

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Hand-made COIL, CABLE AND BLOCK CHAINS.  
Send for prices.

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Berea, O., Nova Scotia, & other brands  
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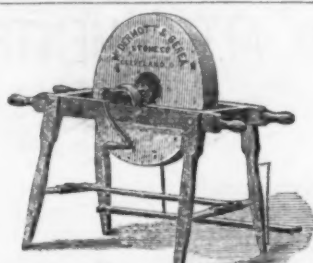
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Of all description.

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P. L. Cole, Constitution, Ohio, will be supplied  
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of genuine Nova Scotia and other grits from our  
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Stones for Machinists, Carpenters, Farmers and  
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**CIRCULAR SAWS.**

I use none but best refined

cast steel, selected. All saws

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A trial of our goods will sat-  
isfy the purchaser of their  
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Torrey's Door Springs.

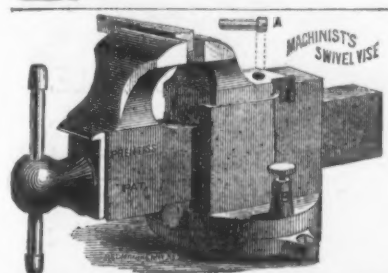
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COG WHEEL

Ice Cream  
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Adjustable Jaw.Stationary and Pat. Swivel Bottoms,  
Adapted to all kinds of Vise Work.

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Manufacturers of WEEKS' PATENT  
COMBINATION BEAM SCALES,  
562 Washington St., Buffalo, N. Y.  
Price of 3-ton scale, platform 7 x 14 feet, \$55.00  
Other sizes proportionately low in price.  
EVERY SCALE WARRANTED ACCURATE AND DURABLE.  
WEEKS & RAY, Prop'rs.THE  
Improved Howe ScalesPortable Scales,  
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R. R. Depot Scales,  
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Scales, Grain Scales, Platform  
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Send for price list, stating what you want.TINIUS OLSEN & CO.,  
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Transom  
Lifter  
and Lock.For all kinds  
of Transoms,  
Fanlights and  
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and price list.J. F. WOLLENSAK,  
Patentee and Sole Manufacturer,  
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STANDARD SHAFT COUPLING SPRING.

Chicago, Ill.  
July 24, '81.

Gentlemen:

You may enter  
our order for  
5000 sets of your  
Standard Shaft  
Coupling Springs  
(600 sets a month).  
A. A. ABBOTT  
& CO.

Side View.

One dozen pairs, japanned,  
expressed to the responsible  
hardware or carriage  
trades for \$1.50 (per gross,  
\$18.40 net, note, 5 per cent.  
off 30 days, 10 off spot cash).  
Discount to jobbers. Splen-  
did selling article for com-  
mercial travelers. (Nickel-  
plated springs \$3 per doz.  
pairs). Dealers and the  
trade also supplied by the  
E. D. Clapp Mfg. Co., Au-  
burn, N. Y., and Wilcox &  
Barnes, N. Y.

Front View.

Howe, Birmingham, Conn. Perfect Anti-Rattle and  
Shaft Bolt Locker, and looks neat on a buggy. Sold  
by all hardware dealers everywhere. Orders, large  
or small, filled promptly.A. G. MOOREY & CO., 90 Randolph Street,  
(McCormick Block), CHICAGO,  
Manufacturers for U. S. & Canada, under Letters  
Patent.

Brass Molders and Manufacturers

write for sample and price of Fine Red Brass  
Molding Sand.

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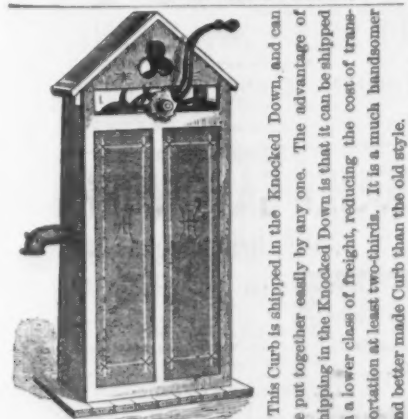
"Climax"  
BARREL  
TANK ATTACHMENTS.

"Climax"

Is designed to be attached to any Barrel or Cask,  
thereby converting the same into a temporary Tank,  
fitted with an effective Pump, and while protecting  
contents from dirt and waste, the owner has entire  
control of same, by simply locking the cover.  
It entirely does away with the labor and waste  
attendant upon emptying Barrels into any of the  
numerous Metal Tanks, while securing all the con-  
veniences of the same, at a GREATLY REDUCED COST.  
The Apparatus can be adjusted in a few moments  
to a Barrel of any size, and as quickly shifted to  
another when contents are exhausted, the process of  
connecting being very simple.  
It is as compact in form as is consistent with perfect  
efficiency, and we feel confident that a trial will  
demonstrate its practical value.WHO HAS USE FOR IT?  
EVERY ONEWho buys in bulk any of the various  
kinds of Oils, or in fact any Fluid  
that can be Pumped;Every Mill, Factory, or Work-Shop, where Oils or  
other fluids are used, and every store where such  
fluids are retailed, will find the "CLIMAX" just  
what they require.

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Nos. 243 & 245 80. THIRD STREET,  
PHILADELPHIA, PA.A. WYCKOFF, Manufacturer,  
Chain Pump, Tube, &c.,  
ELMIRA, N. Y.

Established 1838.

Bevin Bros. Mfg.  
Co.,

Manufacturers of

SLEIGH BELLS,

House, Tea, Hand,  
Gong Bells, &c.

Bell Metal Kettles.

chandise," as used in this title, signifies any  
goods, wares, work of art, commodity, e:u-  
pound, mixture, or other preparation or  
thing which may be lawfully kept or offered  
for sale.Sec. 366. The word "trade-mark," as used  
in this title, includes any letter, word, de-  
vice, emblem, figure, seal, stamp, diagram,  
brand, wrapper, ticket, label, or other  
mark, lawfully adopted by any person,  
being a mechanic, manufacturer, merchant,  
druggist or tradesman, and usually affixed  
by him to an article of merchandise, to de-  
note that the same is or has been imported,  
manufactured, produced, sold, compounded,  
bottled, packed or otherwise prepared for  
sale by him; and also a signature or mark,  
used or commonly placed by a painter,  
sculptor or other artist upon a painting,  
drawing, engraving, statue or other work  
of art, to indicate that the same was designed  
or executed by him.Sec. 367. A trade-mark is deemed to be  
affixed to an article of merchandise within  
the meaning of this title, when it is placed  
in any manner in or upon, either1. The article itself; or  
2. A box, bale, barrel, bottle, case, cask,  
or other package or vessel, or a cover, wrap-  
per, stopper, brand, label or any other thing  
in, by or with which the goods are packed,  
inclosed or otherwise prepared for sale.Sec. 368. An imitation of a trade-mark  
within the meaning of this title is deemed to  
be a counterfeit trade-mark, when it so far  
resembles a genuine trade-mark as to be  
able to induce the belief that it is genuine.Sec. 369. Whenever a person engaged in  
manufacturing, bottling or selling in bottles,  
soda, mineral waters, porter, ale, cider or  
small beer, has filed and published in the  
manner authorized by law, a description of  
a name, mark or label, usually stamped by  
him on the bottles containing such bever-  
age, every other person who, with-  
out the written consent of such manu-  
facturer or dealer, refills with any bever-  
age, whether genuine or otherwise,  
with intent to sell the same, any bottles  
stamped with such name, mark or label,  
and every person who sells, disposes of,  
purchases or traffics in such bottles, is liable  
to a penalty of 50 cents for every bottle so  
filled, sold, bought, disposed of or trafficked  
in, for the first offense, and \$5 for every  
bottle so filled, sold, bought, disposed of  
or trafficked in, for every subsequent  
offense.Sec. 370. A person who keeps any bottles  
such as are designated in the last section,  
without the written consent of the manufac-  
turer (unless it appears that they were not  
kept with intent to refill), or use or sell them  
in violation of the last section, is liable to  
the penalty therein prescribed.Sec. 371. Whenever a manufacturer or  
dealer mentioned in Sec. 369, or his agent,  
makes oath before a magistrate that he has  
reason to believe, and does believe, that any  
of his bottles, stamped and registered as  
mentioned in that section, are unlawfully  
used by any person selling or manufacturing  
mineral water or other beverage, or that any  
junk dealer or vendor of bottles has any of  
such bottles secreted in any place, the  
magistrate must thereupon issue a search  
warrant to discover and obtain the same,  
and may cause to be brought before him the  
person in whose possession the bottles are  
found, and inquire into the circumstances of  
his possession, and if the magistrate, on  
summary examination, finds that such per-  
son has been guilty of a violation of Sec.  
369, he may impose the fine therein pre-  
scribed, and, if the same be not paid, may  
commit such person to prison for a term not  
exceeding 15 days.Ohio.—A revision of the Statutes of Ohio  
was made and published in 1879. The  
synopsis at § 19 is substantially correct.  
April 9, 1880, an act was passed "To pro-  
tect manufacturers, bottlers and dealers in  
ginger ale, seltzer water, soda water and  
other beverages from the loss of their bot-  
tles and boxes." It provides that man-  
ufacturers of ginger ale, &c., may file with  
Secretary of State and County Clerk de-  
scription of bottles used by them, and cause  
the same to be printed in newspaper of  
county six times a week for six weeks. It  
is made unlawful to use such bottles without  
consent of owners. A violation of this pro-  
vision is made a misdemeanor, and the cul-  
prit shall be fined \$5 for each box and 50  
cents for each bottle trafficked in, destroyed,  
&c., and double that sum for second offense.It is provided that owner may apply to  
a justice on affidavit that he has reason to  
believe and does believe that this act is  
being violated for a search warrant, and  
upon search being made if any such bot-  
tles are found the officer shall arrest the persons  
named in the warrant and bring them before  
the justice for trial.United States.—A new federal trade-  
mark was approved March 3, 1881, as fol-  
lows:AN ACT to authorize the registration of  
trade-marks and protect the same. Ap-  
proved March 3, 1881.Be it enacted by the Senate and House  
of Representatives of the United States of  
America in Congress assembled, That owners  
of trade-marks used in commerce with for-  
eign nations, or with the Indian tribes, pro-  
vided such owners shall be domiciled in the  
United States, or located in any foreign  
country or tribes which by treaty, conven-  
tion, or law, affords similar privileges to  
citizens of the United States, may obtain  
registration of such trade-marks by comply-  
ing with the following requirements:1. By causing to be recorded in the Patent  
Office a statement specifying name, domi-  
cile, location and citizenship of the party  
applying; the class of merchandise and the  
particular description of goods comprised in  
such class to which the particular trade-  
mark has been appropriated; a description  
of the trade-mark itself, with fac-similes  
thereof, and a statement of the mode in  
which the same is applied and affixed to  
goods, and the length of time during which  
the trade-mark has been used.2. By paying into the Treasury of the  
United States the sum of \$25, and comply-  
ing with such regulations as may be pre-  
scribed by the Commissioner of Patents.Sec. 2. That the application prescribed in  
the foregoing section must, in order to  
create any right whatever in favor of the  
party filing it, be accompanied by a writtendeclaration verified by the person, or by a  
member of a firm, or by an officer of a cor-  
poration applying, to the effect that such  
party has at the time a right to the use of  
the trade-mark sought to be registered, and  
that no other person, firm, or corporation  
has the right to such use, either in the iden-  
tical form or in any such near resemblance  
thereto as might be calculated to deceive;  
that such trade-mark is used in commerce  
with foreign nations or Indian tribes, as  
above indicated; and that the description  
and fac-similes presented for registry truly  
represent the trade-mark sought to be regis-  
tered.Sec. 3. That the time of the receipt of any  
such application shall be noted and recorded.  
But no alleged trade-mark shall be regis-  
tered unless the same appear to be lawfully  
used as such by the applicant in foreign com-  
merce or commerce with the Indian tribes, as  
above mentioned, or is within the provision  
of a treaty, convention, or declaration with a  
foreign power; nor which is merely the name  
of the applicant; nor which is identical with  
a registered or known trade-mark owned by  
another and appropriate to the same class of  
merchandise, or which so nearly resembles  
some other person's lawful trade-mark as to  
be likely to cause confusion or mistake in the  
mind of the public, or to deceive purchasers.  
In an application for registration the Commis-  
sioner of Patents shall decide the presump-  
tive lawfulness of claim to the alleged trade-  
mark; and in any dispute between an ap-  
plicant and a previous registrant, or between  
applicants, he shall follow, so far as the  
same may be applicable, the practice of  
courts of equity of the United States in  
analogous cases.Sec. 4. That certificates of registry of  
trade-marks shall be issued in the name of  
the United States of America, under the seal  
of the Department of the Interior, and shall  
be signed by the Commissioner of Patents,  
and a record thereof, together with printed  
copies of the specifications, shall be kept in  
books for that purpose. Copies of trade-  
marks and of statements and declarations  
filed therewith, and certificates of registry so  
signed and sealed, shall be evidence in any  
suit in which such trade-marks shall be  
brought in controversy.Sec. 5. That a certificate of registry shall  
remain in force for thirty years from its  
date; except in cases where the trade-mark  
is claimed for and applied to articles not  
manufactured in this country, and in which  
it receives protection under the laws of a  
foreign country for a shorter period, in  
which case it shall cease to have any force  
in this country, by virtue of this act, at the  
time that such trade-mark ceases to be ex-  
clusive property elsewhere. At any time  
during the six months prior to the expira-  
tion of the term of thirty years, such regis-  
tration may be renewed on the same terms,  
and for a like period.Sec. 6. That applicants for registration  
under this act shall be credited for any fee,  
or part of a fee, heretofore paid into the  
Treasury of the United States with intent  
to procure protection for the same trade-  
mark.Sec. 7. That registration of a trade-mark  
shall be prima facie evidence of ownership.  
Any person who shall reproduce, counter-  
feit, copy or colorably imitate any trade-  
mark registered under this act, and affix  
the same to merchandise of substantially  
the same descriptive properties as those de-  
scribed in the registration, shall be liable to  
an action on the case for damages for the  
wrongful use of said trade-mark, at the suit  
of the owner thereof; and the party ag-  
grieved shall also have his remedy accord-  
ing to the course of equity, to enjoin the wrong-  
ful use of such trade-mark used in foreign  
commerce or commerce with Indian tribes,  
as aforesaid, and to recover compensation  
therefor in any court having jurisdiction  
over the person guilty of such wrongful act,  
and courts of the United States shall have  
original and appellate jurisdiction in such  
cases, without regard to the amount in con-  
troversy.Sec. 8. That no action or suit shall be  
maintained under the provisions of this act  
in any case when the trade-mark is used in  
any unlawful business, or upon any article  
injurious in itself, or which mark has been  
used with the design of deceiving the public  
in the purchase of merchandise, or under  
any certificate of registry fraudulently  
obtained.Sec. 9. That any person who shall procure  
the registry of a trade-mark, or of himself  
as the owner of a trade-mark, or an entry  
respecting a trade-mark, in the office of the  
Commissioner of Patents, by a false or  
fraudulent representation or declaration,  
orally or in writing, or by any fraudulent  
means, shall be liable to pay any damages  
sustained in consequence thereof to the in-  
jured party, to be recovered in an action on  
the case.Sec. 10. That nothing in this act shall pre-  
vent, lessen, impeach, or avoid any remedy  
at law or in equity which any party aggrieved  
by any wrongful use of any trade-mark  
might have had if the provisions of this act  
had not been passed.Sec. 11. That nothing in this act shall be  
construed as unfavorably affecting a claim  
to a trade-mark after the term of registra-  
tion shall have expired; nor to give cog-  
nizance to any court of the United States in  
an action or suit between citizens of the  
same State, unless the trade-mark in contro-  
versy is used on goods intended to be trans-  
ported to a foreign country, or in lawful  
commercial intercourse with an Indian  
tribe.Sec. 12. That the Commissioner of Patents  
is authorized to make rules and regulations  
and prescribe forms for the transfer of the  
right to use trade-marks and for recording  
such transfers in his office.Sec. 13. That citizens and residents of this  
country wishing the protection of trade-  
marks in any foreign country, the laws of  
which require registration here as a con-  
dition precedent to getting such protection  
there, may register their trade-marks for  
that purpose as is above allowed to foreign-  
ers, and have certificate thereof from the  
Patent Office.Virginia.—By an act approved March 9,  
1880, it is provided that manufacturers and  
venders of beer, mineral water and other  
beverages in bottles, may file with the clerk  
of the Corporation Court of the city of Alex-



andria a description of such bottles and marks, and cause the same to be published for two weeks in a daily or weekly newspaper published in said city. Clerk to copy and index files. Fee, \$1.

It is made unlawful for any person, without the permission of the owner, to fill with beer, mineral water or other beverage any such bottles so marked and not bought by him of such owner. Penalty, 50 cents for each bottle so filled, &c., for first offense, and \$5 for subsequent offense, to be recovered as other fines are recovered.

(To be continued.)

#### LABOR AND WAGES.

The stove molders who about two weeks ago left Orr, Painter & Co.'s works, Reading, on a strike for an advance of 10 per cent., will go to work again this week, a satisfactory compromise having been effected. The number of men who struck was some 70, and since then only the apprentices have been working in the foundry. When the advance was asked, the firm, who had already fixed their schedule of prices for the fall and winter trade, and who had entered into numerous contracts for the delivery of goods at the rates determined upon, offered a concession of 5 per cent., which, however, was refused, and the molders up to yesterday adhered rigidly to their original demand. In accepting the compromise of 5 per cent., it has been reported that the molders were induced to do so with the understanding that the additional 5 per cent. would be granted at some future time. Now that Orr, Painter & Co.'s foundry will again be in full blast, operations will be prosecuted vigorously, as the firm have a great many orders to fill, and the outlook for a brisk trade was never brighter.

Three hundred workmen on the Chesapeake and Ohio Railroad on the 24th ultimo struck for an advance to \$1.50 per day, with 10 hours' work and weekly pay.

New Orleans dispatches state that the strike of cotton handlers continues. A number of draymen are at work under the protection of the mounted police. No violence is reported, and but little headway is made against the strikers. Some laborers who came from outside points returned home, and those at work, knowing but little of the duties required of them, do not accomplish much. So far there are only a few hundred men employed, while the strikers number 10,000.

The laborers on the new railroad between Glen's Falls and Lake George struck recently for an increase of wages from \$1.35 to \$1.50 per day.

A general strike took place at Galveston, Tex., on the 2d among several classes of workmen, including longshoremen, car drivers, laborers at the oil mills, cotton pickers, &c. The demands of the longshoremen only were acceded to.

Seventy-five men employed by the New Jersey Central Railroad Company at their piers at Jersey City, struck on the 2d for 17 cents per hour. They have been receiving 15 cents.

The Cincinnati *Artisan* of the 3d inst. says: "It is very difficult to arrive at any definite conclusion as to the status of the ironworkers' strike. Both parties claim to be successful, and declare the imminent withdrawal of the other party from the contest; but the strife and strike still hold out. There has not been a more baseless and foolish strike in the history of American industry. All the indications point to the Pittsburgh iron workers as the instigators and upholders of the strike. If this is ever proved beyond the possibility of doubt, the iron mills of Cincinnati will have to understand that, besides the fair competition between fair-minded business men, that is always a factor in business, there is yet another factor, which is the disposition of ironworkers themselves to use the power of their organization to overthrow the industry of one city for the upbuilding of that of another."

#### Copper.

Everybody knows the weight and value of an ordinary penny-piece, and that it is principally composed of copper; so that if any one were to find a great lump of that metal in the earth, weighing 420 tons, there would be a fine fortune. Such a mass of pure native copper was found in the Minnesota mine in 1857, and it was 45 feet long, 22 feet broad and 8 feet thick. There is a piece of copper in the museum of Lisbon which came from Peru, and it weighs 2,616 pounds; and near Brunswick, in New Jersey, there was a thin sheet of pure copper found in the rocks which could be traced for several yards. There are some very profitable mines near Lake Superior, between Canada and the United States, which often yield 8000 tons a year of pure copper, and in 1853 a great lump of copper was found at Keweenaw Point, which weighed 200 tons, and was 40 feet in length. It contained, moreover, much silver, and when the copper was cut and polished it looked very beautiful. In most parts of the world small pieces of pure copper have been found in cracks in the hardest rocks, and man, soon after he began to use copper. Then he mixed it with tin and produced weapons of bronze, which were used for a very long period before iron was discovered. The early natives of North America, like all other, first of all used sharpened stones as their knives and spear-heads, but they soon began to make use of the yellow metal they found every now and then among the rocks. They even tried to find copper, and obtained it from the mines on Lake Superior, for the present miners come upon the old diggings while working in places where gigantic trees and dense vegetation must have existed for thousands of years. Copper is usually found combined with other substances to form an ore, and this has to be burned and run into shapes before the pure copper is obtained. It is most probable that all copper, and even the great lumps of pure native copper, were once in form of ore, or combined with other substances. Native copper is found close to rocks which are exactly like the lava and slag which are cast out of volcanoes. These rocks were forced into the earth while in a molten state, and intense heat effected the

corper ores close by. The substances combined with the copper to form the ore were destroyed by the heat, and the pure metal remained.

**Trip of the Torpedo Ram Alarm.**—A Washington telegram says: "The recent trip of the torpedo ram Alarm from New York to Washington, proved to be a satisfactory one in every respect. Going down to Sandy Hook the vessel made about eight knots an hour under two boilers. After running about five hours the fires began to get a little 'dirty,' and steam was gotten up in a third boiler. The ship then made about seven knots an hour. No greater speed was desired on so long a trip, as the Alarm cannot carry a very large supply of coal, not having been built for long voyages. The engines were only stopped twice between the New York Navy Yard and Blakistone Light, in the Potomac River—once to permit of communication with her convoy, the Tallapoosa, and once for the purpose of taking deep sea soundings. The Mallory steering propeller worked perfectly at all times. The weather during the trip was generally good. A thick fog, however, prevailed on Monday night, and the Alarm lost sight of her convoy several times for short periods." The Alarm will be the flag-ship at the approaching Yorktown celebration.

The recent hurricane which struck the coast of Georgia and South Carolina on Saturday, 27th ult., admirably illustrated the value of the United States Signal Service, the customary warning having been bulletined several days previously. The steamers San Antonio and Juniata left port in disregard of the warning and were disabled, though the Havana steamer Newport and Cromwell's New Orleans steamers gallantly weathered the tempest, with machinery and engines intact. While it behooves commanders of steamers to be cautious, they find a firm dependence in the excellence of their propelling power.

Who is to buy the Great Eastern? This celebrated steamship, which is at present lying at Milford, is to be offered by auction in London, on the 19th of October next, by Messrs. C. W. Kellock & Co., the Admiralty brokers. Notwithstanding the recent development of modern shipbuilding, the Great Eastern still remains the largest ship ever constructed, being 679 feet long, 82 feet broad and 60 feet deep, and of 13,344 tons net register. She is popularly known in connection with the laying of the Atlantic cable in 1865, and possibly the cable companies may be looked upon as the most likely purchasers.

The Railroad Gazette records the construction of 191 miles of new railroad, making 3110 miles this year, against 2631 miles reported at the corresponding time in 1880, 1273 miles in 1879, 947 miles in 1878, 842 miles in 1877, 1142 miles in 1876, 574 miles in 1875, 913 miles in 1874, 1966 miles in 1873 and 3372 miles in 1872.

#### Special Notices.

### NEW MACHINE TOOLS

FOR SALE BY

### COOKE & CO.,

6 Cortlandt St., N. Y.

- One Gould Engine Lathe, 26 in. swing, 12 1/2 ft. bed.
- Two New Haven Engine Lathes, 18 in. swing, 8 ft. bed.
- One Prentice No. 3 Drill, 22 in. swing, back geared, power feed.
- One Gould 10 in. Shaping Machine.
- One Gould 15 in. Shaping Machine.

All of the above are new tools of the latest design, and may be seen at our store, or full particulars will be sent by mail.

COOKE & CO., 6 Cortlandt St., N. Y.

#### For Sale.

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns regarded as part of the property. Boiler Shop, Blacksmith Shop and Factory for the manufacture of heavy cast iron screens. Well located in the borough of Shamokin, Pa., with the best facilities for shipping by rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. The works are now running, but in a very short time possession can be given. Easy terms of payment are offered to suit a purchaser of limited capital. Offered for sale by

WM. McILVAIN & SONS, Reading, Pa.

#### Wanted—Partner.

A Mechanic with 30 years' experience making Thimbles from all kinds of metals, wishes a partner with money to go into the manufacturing of Steel, German Silver and Brass Thimbles.

Address, D. H. T., Box 734, Ansonia, Conn.

#### FOR SALE.

Eight H. P. Portable Holster, J. S. Mundy; 80 H. P. Horizontal Engine; new Vertical Boiler, 48 in. x 10 ft., 124 tubes; 6 x 8 Double Engine, link motion; 18-in. x 12 ft. Lathe; 3-column Drills; Root Blowers, Nos. 1 and 2; 12 x 12 Vertical Engine, extra strong build; 6 Hangers, 2 x 16; 20-inch Drop; Copper-smith Shears, Heavy Platform Hoist.

A. G. BROOKS & WINEBRENER, 261 N. 3d St., Philadelphia.

#### Machine Tools.

New and second hand. Among them a 200-lb. Bradley Hammer, Pulley Lathes, Boring Table, Foundry Ladles, Engines, Pumps, &c.; also, a great variety of Patterns and Drawings. Send for circular.

WM. B. PARDEE, New Haven, Conn.

**SITUATION WANTED.**—By a first-class blacksmith, as foreman in a locomotive or car shop. Address, 2304 Ingersoll St., Philadelphia, Pa.

#### Special Notices.

### Rolling Mill for Sale or to Lease.

The Real Estate, Machinery, Fixtures and Tools of the Ligonia Iron Company (formerly Portland Rolling Mills) are offered for sale, or will be leased to satisfaction on terms.

The property of the company consists of 60 acres of land at tide-water in the town of Cape Elizabeth, Cumberland Co., within ten minutes' drive of the city of Portland. Besides the mill buildings, the company owns 55 tenements in 28 buildings, one hall used for church purposes, two stores and a thoroughly well-fitted office, with fire-proof vault and all modern improvements. The buildings are in good repair.

The mill contains one 10-inch train and one 18-inch train, with all the machinery appertaining for the manufacture of rails and bar iron. With a small additional outlay the machinery could be fitted for rolling steel rails from imported blooms, the capacity of the mill being about 25,000 tons per annum.

The property is provided with a thoroughly built wharf, at which vessels of 800 tons capacity can lie at low water, and being directly connected by rail with all the railroads centering at Portland, is probably the most desirable situation for the manufacture of steel rails in New England. Address, LIGONIA IRON CO., Portland, Maine.

#### New and Second-Hand MACHINERY.

One Horizontal Engine, 15 1/2 in. x 30 in. Todd & Rafferty.  
One Horizontal Engine, 3 in. x 6 in.  
One Horizontal Engine, 300 H. P.  
One Horizontal Engine, 12 to 25 H. P.  
One Horizontal Return Tub. Boilers, 100 h. p. each.  
One Horizontal Tub. Boiler, 6 ft. x 24 ft. 67 1/2 in. tubes.  
One Horizontal Tub. Boiler, 4 1/2 ft. x 13 1/2 ft. 43 1/2 in. tubes.  
One Locomotive Steel Boiler, 30 h. p.

#### MACHINISTS' TOOLS.

Twelve Lathes, 25 x 12. New.  
Ten Lathes, 18 x 8. New.  
One Cameron Pump, No. 2.  
One Styles & Parker Foot Press.  
One Root Gas Exhauster, No. 1/2.  
One Planer, 24 in. x 14 ft. 10 in.  
Two 10-in. Shaping Machines, Gould's.  
One Milling Machine, Wood & Light.  
One Tapping Machine, 6 in. Saunders' Sons.  
One Tapping Machine, 1 1/2 in. Saunders' Sons.  
One Hydraulic Press, 8 inch ram.  
One 300-ton Hydraulic Press and Pump.  
One Knowles Special Pump, No. 7.  
One Bliss & Williams Foot Press.  
One Peck, Stow & Wilcox Foot Press.  
A large stock of Shafting, Pulleys, Hangers and Miscellaneous Machinery.  
One Upright Drill, 36 inch.  
One Barbed Rock Drill, No. 4. New.  
One Hotchkiss Compressed Air Hammer.  
Fifty Wrought Iron Vises, all sizes.  
One Daniels Planing Machine.  
Three pair Fairbanks Scales, 2500 lbs. each.  
One Pipe Cutting Machine.  
One pair Paper Rolls.

**J. GRAY'S MACHINERY DEPOT,**  
37 Dey Street, New York, U. S. A.

### TO INVENTORS AND MANUFACTURERS.

#### THE SEMI-CENTENNIAL EXHIBITION

#### OF THE AMERICAN INSTITUTE

OF THE CITY OF NEW YORK.  
Will open September 14, 1881. Heavy machinery will be received as early as August 23; other goods, September 1. Intending exhibitors must make early application to secure proper space and classification. For blanks and information address GENERAL SUPER-INTENDENT AMERICAN INSTITUTE, New York City.

#### Engine and Fly-wheel for Sale.

One second-hand double engine in good running order, with Mason link motion, made by the Lawrence Machine Co.; cylinders, 18 x 40. A 20-ton fly-wheel, 20 feet in diameter, made from the very best of charcoal iron. The above will be sold at a bargain if applied for soon. Address, WASHBURN IRON CO., Worcester, Mass.

#### For Sale.

Four set of Blocks for wire drawing (brand new) in complete order, ready for use.  
Also a lot of Dies of various sizes.  
One Pulley, 6 ft. 6 in. diameter, 15 in. face, 3/4 in. shaft.  
One Pulley Clamp, 22 in. diameter, 12 in. face, 1/2 in. shaft. Two lengths of Shafting, 3/4 in. diameter.  
For particulars inquire of MASS. SCREW CO., Holyoke, Mass.

#### Notice.

The undersigned firm would be pleased to accept the representation of first-class firms manufacturing machinery. Address, J. S. LIZARS & CO., Manufacturers of Shields & Lizars' Feed Water Heater and Purifier, and dealers in New and Second-hand Machinery, 33 Fifth Avenue, cor. Lake Street, Chicago, Ill.

#### Vertical Boring and Turning Mill

#### Wanted,

new or second hand, to swing 6 to 8 feet. State maker, time of delivery, price, age, condition and where it can be seen.

Address, STOKES & PARRISH, 30th and Chestnut sts., Philadelphia.

#### Wanted.

A Steam Hammer, 300 to 500 lbs., in good order, to be delivered at once. State the maker, how much used, and lowest cash price.

Box 610, Providence, R. I.

#### Wanted.

To arrange with responsible parties having proper facilities and experience for the manufacture of some improved wood-working machinery, destined to meet extensive sales when thoroughly introduced. For further particulars, address B. H., Office of The Iron Age, 83 Reade St., New York.

**FACTORY FOR SALE.**—In Willoughby Street, Brooklyn, N. Y., with engines, boilers and shafting, suitable for any kind of light or heavy manufacturing purposes. Plot 200x200. One three-story building, fronting on three streets. Address W. S. P. PRENTICE, Prentice Stores, Brooklyn, N. Y.

#### WANTED.

A man of 10 years' experience in the Hardware trade desires a situation. Can give first-class references.

Address, BATAVIA, N. Y. P. O. Box 756.

#### Sanderson Bros. Steel Co.

Forty shares for sale at a discount.

EDWARD FRITH & SON, 241 Pearl Street, New York

#### Special Notices.

### NUT AND BOLT MACHINERY

For Sale.  
Second-hand Lewis, Oliver & Phillips Header. Pratt & Whitney Tire Blank Header. Also, over ONE HUNDRED different sizes and patterns of Bolt Cutters, Tappers, Nut Machines, &c.

The only Specialists in this line in the United States. Patentees and owners of the celebrated National Bolt Cutters.

### NATIONAL MACHINERY CO.,

Cleveland, O.

#### For Sale.

The Little Schuylkill Rolling Mill, at Milldale, Schuylkill County, Pa., near Port Clinton, on the line of the Philadelphia and Reading Railroad, consisting of a Merchant Bar Mill in complete running order, with a splendid water power sufficient to run the mill two-thirds of the year. Engines, Boilers, Foundry and Machine Shop, with Lathes for turning rolls, and all other appurtenances necessary to commence operation at once. Together with dwellings, stables and large tract of land, to be sold low if applied for soon. For further particulars address or apply to J. O. RICHARDSON, No. 232 Dock Street, Philadelphia.

#### FOR SALE.—Machinery in Store.

One 8 in. swing Drill Lathes 4 ft. bed, hollow spindles.  
One 4 x 6 Vertical Engine.  
One 8 x 12 Portable Engine and Boiler.  
One 8 x 12 Portable Engine and Boiler.  
Two 8 x 12 Stationary Engines.  
One 8 1/2 x 12 Stationary Engine.  
Three 5 x 12 Stationary Engines, link motion, suitable for hoisting purposes.  
One Cooper Steam Pump, 8 in. steam, 4 in. water, 14 in. stroke. The above are all second hand, re-fitted, and will be closed out cheap.  
Wood-working Machinery, Knowles' Steam Pumps, Fan and Cupola Blowers, Exhaust Fans, Centrifugal Pumps, Harrington's Screw Hoists, Emery Goods and manufacturers' supplies. The celebrated PHENIX STEAM ENGINES, 15 to 50 horse-power. Second to none, and 20 per cent. cheaper than any others.

I. H. PRATT, 15 S. Water St., Cleveland, O.

#### NOTICE!

SPECIAL SALE OF

### CUTLERY.

SEE ADVERTISEMENT ON PAGE 10

OF

BRADFORD & ANTHONY, Boston.

#### NOTICE.

### TO THE HARDWARE TRADE,

Retail and Wholesale.

Before buying, send to me for quotations.

Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware.

A. W. WHEELER,

141 Lake St., Chicago.

#### DU PUY'S DIRECT PROCESS

Reduces ore, puddling, heating furnace, forge clinder, iron and steel scale and hammer slag, squeezed and rolled to bars at one heat. Blooms of 150 lbs. made in one hour from forge clinder, yielding 25 lbs. out of 100 lbs. of clinder. It eliminates phosphorus, producing superior metal at low cost for crucible or open hearth steel. The furnace is an ordinary reverberatory with slight modifications.

CHARLES M. DU PUY

No. 14 North Fifth Street, Philadelphia.

#### The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,

Issue Licenses to use the Process for the

Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens

Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working.

See page 17 of The Iron Age of Oct. 25th, 1877.

#### STEEL:

Its History, Manufacture, Properties, and Uses.

By J. S. JEANS,

Secretary of the Iron and Steel Institute.

Section I. History of Steel: Chap. 1. History of Steel; 2. Early History in England; 3. Progress of Invention; 4. History of Bessemer Process; 5. Siemens-Martin Process; 6. Other Steel-making Processes; 7. Steel in America; 8. Germany; 9. France; 10. Austria; 11. Russia; 12. Sweden; 13. Other Countries.—Section II. Manufacture of Steel: Chap. 14. Cementation and other Methods; 15. Manufacture by Bessemer Process; 16. Siemens-Martin Process; 17. Other Methods.—Section III. Chemical and Physical Properties of Steel: Chap. 18. Phosphorus in Steel; 19. The Use of Manganese; 20. Spiegeleisen; 21. Sulphur in Steel; 22. Silicon in Steel; 23. Tensile Strength of Steel; 24. Mechanical Tests of Steel; 25. Analysis of Steel.

Section IV. Uses of Steel: Chap. 26. Application of Steel to Railway Purposes; 27. To Shipbuilding; 28. To Bridge Building; 29. To General Purposes; 30. Guns and Armor Plates; 31. Other Purposes.

Price, . . . . . \$1.50

DAVID WILLIAMS,

83 Reade Street, - - New York.

#### Bissell & Welles,

Wholesale Hardware Auctioneers

83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

#### HEAVY IRON WORKS WANTED.

An Eastern Manufacturing Company, doing a profitable business in heavy wrought iron structures, the manufacture and sale of which they control for the United States and Canada, wish to establish additional works, located in the West, South, Pacific Coast and Province of Ontario. Must have first-class freight advantages for receiving rolled structural and merchant iron. Address

WM. O. DOUGLAS, Binghamton, N. Y.

#### Special Notices.

### JOB LOT.

ELEY BROTHERS' GENUINE BLUE CARTRIDGE CASES, Twelve Gauge.

The best paper shell in the market. For sale cheap. Supply limited.

ALFRED FIELD & CO.,

93 Chambers St., N. Y.

### ELLENDALE FORGE FOR SALE.

This valuable property, situated near Harrisburg, Pa., on the Schuylkill and Susquehanna branch of the Reading Railroad, comprising about 1500 acres of woodland, nearly all fit to cut, is offered for sale on easy terms and long payments. It has run-out, the Wilbraham blower and all necessary improvements to do a large and profitable business. A large stock of charcoal is on hand, and everything about the property is in successful operation. Apply to J. W. KELLEGER, Lebanon, Pa.

#### For Sale.

Two Corliss Condensing Beam Engines,

32 in. x 72 in. cylinders. Address,

THE HARTFORD ENGINEERING CO., Hartford, Conn.

#### For Sale.

Stock of Hardware, Fixtures, and Good Will of the subscribers, in the city of Norwich, Conn.

Only one other hardware store. Population 27,000.

August 1, 1881.

FULLER & PARISH.

#### For Sale.

A Hardware and Tool Store

on reasonable terms. Probably the most desirable in Jersey City. Doing an excellent business.

Inquire of H. LUTGEN.

#### For Sale.

Hardware Stock and Trade in Michigan.

Those wishing to buy a complete stock and fine trade, and in a beautiful place to live, will find a rare chance by addressing

S., Office of The Iron Age, 83 Reade St., New York.

#### For Sale.

Wishing to make a change, I offer for sale my entire stock of Hardware, Iron, Steel, Paints and Oils. Trade well established and doing a large and profitable business. Will be sold at a sacrifice to close out.

Address for full particulars, H. A. AYER, Dexter, Maine.

#### For Sale.

First-class HORIZONTAL ENGINE. Size of cylinder, 6 x 15.

Twelve-horse-power UPRIGHT BOILER, with Heater and Pump.

BEECHER & PECK,

Lock Box 122, New Haven, Conn.

#### For Sale.

Hardware Stock and Business.

Located in one of the best towns of Northeastern Pennsylvania. Stock clean and well assorted, suited to the requirements of the trade where located. Business of 30 years' standing. For terms and full particulars apply to

JAMES S. KUHN, Towanda, Pa.

#### For Sale.

Ten Double Acting Power Punching Presses, At order. Eight Single Acting Power Punching Presses, At order. Most of the double acting presses are the No. 3 Waterbury Press; the single acting,







Scient to absorb the arrivals, and we do not hear of any iron going into store. We quote Eglington, \$21; Carnbroe, \$22.50; Coltness, \$23.50 @ \$24; Glengarnock, \$22.50 @ \$23; and Gartsherrie, \$23.

Rails.—No new business either in Steel or Iron Rails has come to our notice during the week. We quote Steel at mill (1882 delivery), \$55 @ \$56, and Iron Rails, \$48 @ \$49.

Old Rails.—Sales are reported of 2000 tons T's at \$27.50. The demand is fair, and the tone of the market strong at \$27.50 @ \$28 for T's, and about \$30 for Double Heads.

Scrap.—There is considerable inquiry on the market for Wrought Scrap, but the sales reported have only been in small lots. We quote No. 1 Wrought, \$27.50, ex ship, and \$30, from yard, for prime Selected.

Mr. Seth Wilks, of the old firm of James Williamson & Co., died suddenly on Saturday last, at his summer residence, at Nyack on the Hudson. The funeral took place today.

#### METALS.

Copper.—Sales for the week have been restricted to about 200,000 pounds Lake Superior at 16½¢ @ 17¢, the latter being the asking figures at the close. Baltimore is worth as much. Manufacturers are well stocked with the raw material, but the demand for their goods is brisk all along. London cables Chili Bars, \$29. 10/ and Best Selected, \$25. 10/. "London, Aug. 27.—This market is strong, and during the last day or two better prices have been realized for Chili Bars, which may be accounted for by advices giving light charts for the last half of this month, there being only 700 tons advised, combined also with reports showing that higher prices are ruling at Valparaiso, there being an advance of 10/ per ton. This market, which has remained in such a depressed condition for so long a period, owing to the heavy stocks, does certainly appear as though it is assuming a much better position, and from time to time is being greatly relieved, chiefly by the continued limited supplies from Chili, and although from other sources supplies are still maintained, yet the last statistics have shown that the reduced production in Chili has been sufficient to make some satisfactory impression upon the public stocks here, and if deliveries are upheld at their present average, there seems good cause to anticipate that a much higher range of prices will shortly be established while the position of holders of Chili Bars is thereby greatly improved. Manufacturers are quoted as under: Pit and Hot-rolled Flat Bottoms, 27½¢ pound; Cold-rolled Flat Bottoms and Pit Bottoms, with flange cut, 28½¢; Braziers, 26¢ @ 32¢, as to size and weight; Circles, 26¢ @ 32¢; Sheets, 26¢ @ 28¢; Sheathing, 24¢, and Bolt Copper, 26¢.

Tin.—About 100 tons Straits have been sold during the week wholesale, at 20½¢ @ 21¢. Our market rules firm, with an upward tendency. London cables Straits Tin \$21, cash, on the spot, and calls the market active, with an upward tendency. Singapore is unchanged at \$28.75 per picul. Exchange there has advanced in sympathy with silver in London to 3/9½. We quote at the close large lines: Straits, 21½¢; and English Common, 21½¢.

The following statistics of Tin have been prepared by M. Charles Nordhaus, New York, September 2:

STATISTICS OF TIN AUGUST 1.		Tons.
August 1—Stock in United States in first and second hands.....	2,130	
August 1 to 31—Arrivals in United States.....	700	
Total.....	2,830	
August 1 to 31—Consumption in United States.....	880	
September 1—Stock in United States in first and second hands.....	2,000	

STRAITS TIN ALFLOAT.		Tons.
May 28—Sailed, Centaur, for Boston, due September 13.....	50	
June 13—Sailed, the Schiller, for New York, due October 13.....	150	
June 29—Sailed, Mercury, for New York, due October 29.....	50	
July 6—Sailed, Carleton, for Boston, due November 8.....	50	
July 20—Sailed, N. Gibson, for Boston, due November 30.....	50	
August 12—Sailed, Minuet, for New York, due December 12.....	300	
July 1 to 15—Steamers for New York, due September.....	100	
July 16 to 31—Steamers for New York, due September-October.....	200	
August 1 to 15—Steamers for New York, due September-October.....	400	
October-November.....	370	
Australian and Billiton, October-November.....	450	

Total stock and visible supply (equal to about four months fall consumption).....3,930

August.		Ships' Cons'ns.	Tons.
Straits to United States.....	800	900	
Straits to England.....	1,300		
Australia to England.....	1,100		
Holland.....	700		
Java to Holland.....	250		

Total.....2,150

"London, Aug. 27.—There is still a large business doing in this metal, but prices are rather weaker, the market having been somewhat affected by the rise in the bank rate. This is not surprising, for owing to this metal being speculated in so largely, any chance arising of loans not being able to be made upon equally favorable terms as of late, necessarily checks business and causes sales among weak holders. But beyond what little adverse influence is thereby created, there does not appear any cause for despondency as regards the future course of the market, because what little contrary effect is thereby made can be only of temporary duration, the ultimate position of the market being necessarily influenced by the question of supply and demand."

Tin Plates.—There has been a most active jobbing demand at New York during the week, but no speculative energy seems to develop, competition among sellers being very great, facilitated by the cable. The market, on the whole, is quiet, but firm toward the close at the ensuing quotations for large lots, ordinary brands, per box:

Charcoal Bright, \$5.75 @ \$5.87½; ditto Ternes, \$5.25 @ \$5.37½; Coke Tin, \$5.10 @ \$5.12½; and ditto Ternes, \$5 @ \$5.06½. People at Liverpool seem to be sanguine of higher prices, this hope being based upon the great decrease in stocks at that point, claimed to be only 50% of what they were six weeks since. The feeling there is a strong and confident one. They quote Coke Tin, per cable, 15/6 @ 16/.

Lead.—Sales for the week have been limited to 200 to 300 tons at \$4.95, and a few small jobbing lots as high as 5¢. There is at present quite a lead famine here, and at Newark little can be got, orders being about 30% ahead of available stuff. The position of Lead is so favorable and so sensitive to anything that can be construed to give it a further lift, that an advancing London market would at once start a corresponding improvement on this side, and cause common Lead here to rise to 5½¢ @ 5½¢, probably. Should the market permanently attain a higher figure on this side, it would, on the other hand, invite importation again, the effect of which would be detrimental to the general run of trade here, for 2000 tons of European Lead would suffice to cause months of stagnation among us. Consumption of Lead seems to be unusually active just now, not only in this country, but equally as much in Europe. There is no Lead on the way now from San Francisco unsold. No Refined is offering; the last sale was made at 5½¢. "London, August 27.—Only a moderate business continues to be transacted in this metal; nevertheless prices continue strong, while in some cases a further rise has been made. Manufacturers are quoted as follows: Sheet Lead, 7½¢; Lead Pipe, 7½¢; Tin-lined ditto, 15¢; Block Tin ditto, 35¢; Drop Sheet, 7½¢.

Spelter and Zinc.—Domestic Spelter remains dull and nominal at 5¢ @ 5½¢, and Silesian, in which nothing transpires, at 5½¢ @ 5½¢. "London, Aug. 27.—Ordinary brands are still quoted at £15. 10/ @ £15. 15/. The tone of the market is, however, quieter than it was, with less demand and more readiness to meet it."

Antimony.—The demand during the week has been fair, at 15¢ for Cookson's brand and 14½¢ for Hallett's.

#### OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy.....	10 1/2	10 1/2
Copper Bottoms.....	10 1/2	10 1/2
Yellow Metal.....	10 1/2	10 1/2
Brass, heavy.....	10 1/2	10 1/2
Brass, light.....	10 1/2	10 1/2
Composition, heavy.....	10 1/2	10 1/2
Lead, heavy.....	10 1/2	10 1/2
Tea Lead.....	10 1/2	10 1/2
Zinc.....	10 1/2	10 1/2
Pewter, No. 1.....	10 1/2	10 1/2
Pewter, No. 2.....	10 1/2	10 1/2
Wrought Iron.....	10 1/2	10 1/2
Light do.....	10 1/2	10 1/2
Stove Plate.....	10 1/2	10 1/2
Machinery do.....	10 1/2	10 1/2
Grate Bars.....	10 1/2	10 1/2

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen.....	10 1/2	10 1/2
White Cotton, New.....	10 1/2	10 1/2
No. 1.....	10 1/2	10 1/2
No. 2.....	10 1/2	10 1/2
Seconds.....	10 1/2	10 1/2
Soft Woollens.....	10 1/2	10 1/2
Mixed Rags.....	10 1/2	10 1/2
Gunny Bagging.....	10 1/2	10 1/2
Gunny Butts.....	10 1/2	10 1/2
Kentucky Bagging.....	10 1/2	10 1/2
Rope Stock.....	10 1/2	10 1/2
Newspapers.....	10 1/2	10 1/2
Waste Paper and Scraps.....	10 1/2	10 1/2
Kentucky Bale Rope.....	10 1/2	10 1/2

#### FOREIGN TRADE MOVEMENTS.

The following is a summary of the foreign trade movements for the week ended September 7:

##### IMPORTS

	1870.	1880.	1881.
Total.....	\$6,704,469	\$8,143,151	\$8,550,660
Prev. reported.....	203,807,081	329,105,831	284,014,468
Since Jan. 1.....	\$209,909,550	\$337,308,982	\$303,165,128

Included in the imports of general merchandise for the week were articles valued as follows:

	Quantity.	Value.
Anvils.....	30	\$377
Brass goods.....	39	3,341
Bronzes.....	66	10,035
Chains and anchors.....	90	4,310
Clocks.....	58	9,451
Copper.....	451	451
Cutlery.....	165	49,805
Gun.....	8	1,012
Hardware.....	185	15,448
Iron, pig, tons.....	8	1,201
Iron, sheet, tons.....	5,897	104,585
Iron, other, tons.....	3,641	21,686
Railroad bars.....	15,000	33,217
Iron cotton ties.....	8,000	22,901
Iron, other, tons.....	990	49,473
Machinery.....	69	14,844
Metal goods.....	185	20,177
Nails.....	45	1,076
Needles.....	6	2,008
Nickel.....	13	4,317
Old metal.....	3	3,455
Platina.....	2	864
Platedware.....	3	269
Percussion caps.....	10	2,007
Saddlery.....	8	1,460
Steel.....	29,736	185,824
Silverware.....	5	608
Tin, boxes.....	19,437	88,044
Tin, 45 lb. slabs, 446,338 lbs.....	27,711	27,711
Wire.....	390	5,463

The following are the imports of leading articles, compared with previous dates:

	For the week.	34 weeks of 1881.	Same time 1880.
Cutlery, pkgs.....	165	4,771	6,135
Hardware, pkgs.....	3,641	26,941	906
Same time 1879.....	26,351	443,300	
Lead, pkgs.....	59,796	696,538	462,067
Steel, pkgs.....	19,437	1,048,772	1,048,772
Tin, boxes.....	446,338	10,857,948	20,006,885

#### EXPORTS OF SPECIE.

For the week ended Sept. 3:

Total.....	\$180,850
Previously reported.....	7,578,054
Total since January 1, 1881.....	\$7,658,904

Same time 1880.....	5,413,377
Same time 1879.....	10,850,041
Same time 1878.....	10,850,041
Same time 1877.....	10,850,041
Same time 1876.....	10,850,041
Same time 1875.....	10,850,041
Same time 1874.....	10,850,041
Same time 1873.....	10,850,041
Same time 1872.....	10,850,041

#### EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended Sept. 6:

	1870.	1880.	1881.
Total.....	\$9,082,608	\$10,065,108	\$8,442,510
Prev. reported.....	211,779,740	256,924,323	251,951,732
Since Jan. 1.....	\$221,061,748	\$274,954,431	\$260,394,544

#### EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Sept. 6, 1881:

	Quan.	Val.
<b>Danish West Indies.</b>		
Mf. iron, pkgs.....	108	\$359
Pumps, bxs.....	3	30
Boiler.....	1	505
Plm. gals.....	33	135
Ag. imp. pkgs.....	7	40
<b>Dutch East Indies.</b>		
Sew. ma, cs.....	97	97
Hdw, cs.....	47	47
Plm. gals.....	2049	299
Iron safe.....	1	100
<b>Dutch Guiana.</b>		
Clocks, cs.....	1	132
Plm. gals.....	3978	425
<b>Dutch East Indies.</b>		
Plm. gals.....	418,500	49,250
<b>Amsterdam.</b>		
Plm. gals.....	304,354	24,000
Pumps, pkgs.....	8	745
Hdw, cs.....	23	23
<b>Hamburg.</b>		
Clocks, bxs.....	127	1,759
Spelter, slabs.....	1806	4,033
Plm. gals.....	1,086,578	86,300
Sew. ma, cs.....	514	6,110
Plm. gals.....	19	2,815
Iron pipe, pcs.....	23,005	12,005
Clocks, pkgs.....	246	3,318
Hdw, cs.....	4	2,057
Sew. ma, cs.....	1	100
Mf. iron, pkgs.....	30	1,222
Ag. imp. pkgs.....	6	359
Machy, pkgs.....	45	18,300
L. r. goods, cs.....	11	1,668
<b>Rotterdam.</b>		
Ag. imp. pkgs.....	5	540
Hdw, cs.....	32	769
Ptg. press.....	1	350
Copper, bars.....	186	4,300
Machy, cs.....	9	900
<b>Cronstadt.</b>		
Plm. gals.....	180,158	14,250
<b>Gothenburg.</b>		
Naph. gals.....	40,123	4,262
Plm. gals.....	68,954	5,504
<b>Christiana.</b>		
Plm. gals.....	214,516	18,179
<b>Elisavine.</b>		
Plm. gals.....	191,954	10,000
<b>Konigsberg.</b>		
Plm. gals.....	150,339	13,024
<b>Antwerp.</b>		
Plm. gals.....	348,604	34,143
Mf. iron, pkgs.....	10	1,300
Hdw, cs.....	10	337
<b>Bremen.</b>		
Mf. iron, pkgs.....	16	350
Machy, cs.....	1	250
Plm. gals.....	172	1,641
Ag. imp. pkgs.....	3	180
L. r. goods, cs.....	3	100
<b>Hull.</b>		
Clocks, cs.....	12	405
Machy, cs.....	3	52
Pumps, pkgs.....	13	700
Hdw, cs.....	1	1,012
Naph. gals.....	139,051	17,811
<b>Liverpool.</b>		
Hdw, cs.....	4	1,163
Machy, pkgs.....	10	4,850
Ag. imp. pkgs.....	30	450
Hdw, cs.....	80	1,641
Plm. gals.....	14,949	12,632
Clocks, cs.....	1	55
L. r. goods, cs.....	3	3,708
Plm. gals.....	23	450
Clocks, cs.....	172	3,000
<b>Bristol.</b>		
Plm. gals.....	431,183	30,167
Naph. gals.....	338,401	19,980
<b>London.</b>		
Or. zinc, bxs.....	50	430
Light rods, cs.....	11	1,532
Machy, cs.....	19	1,532
Car wheels.....	43	760
L. hoops, bbls.....	205	750
Mf. iron, pkgs.....	97	907
Clocks, bxs.....	1	1,251
Ag. imp. pkgs.....	6	400
Metal gds, cs.....	3	440
Sew. ma, cs.....	3	6,300
Hdw, cs.....	126	3,500
L. r. goods, cs.....	14	1,029
Naph. gals.....	216,175	18,000
Plm. gals.....	1,040,258	93,250
Pumps, pkgs.....	10	815
Pbr. traps, pkgs.....	3	815
Rifles, cs.....	1	188
<b>Gibraltar.</b>		
Plm. gals.....	70,000	8,030
Clocks, bxs.....	13	233
<b>Malta.</b>		
Plm. gals.....	122,000	13,000
<b>Glasgow.</b>		
Machy, cs.....	3	253
L. r. gds, cs.....	3	253
Mf. iron, pkgs.....	36	430
Clocks, bxs.....	38	835
Hdw, cs.....	24	723
Pumps, pkgs.....	4	31
Ag. imp. pkgs.....	3	165
White mt. cs.....	5	300
<b>Barcelona.</b>		
Plm. gals.....	104,363	8,000
<b>Havre.</b>		
Naph. gals.....	277,916	23,925
Mf. iron, pkgs.....	16	151
Clocks, pkgs.....	3	181
Ag. imp. pkgs.....	6	465
Plm. gals.....	298,500	18,700
<b>Bordeaux.</b>		
Windmills, cs.....	9	500
Hdw, cs.....	5	800
<b>Bayreuth.</b>		
Plm. gals.....	126,000	13,860
<b>Venezuela.</b>		
Plm. gals.....	3000	387
Hdw, cs.....	25	207
Mf. iron, pkgs.....	96	1,000
Ag. imp. pkgs.....	3	174
Nails, cs.....	10	92
Clocks, cs.....	3	44
Guns, cs.....	1	40
Sew. ma, cs.....	11	412
Revolvers, cs.....	1	67
<b>Chili.</b>		
Hdw, cs.....	355	5,705
Mf. iron, pkgs.....	15	100
Nails, bxs.....	10	100
Tacks, cs.....	212	1,434
L. r. goods, cs.....	1	77
Ag. imp. pkgs.....	9	284
Ag. imp. pkgs.....	58	1,529
Mf. iron, pkgs.....	73	587
Nails, cs.....	518	1,640
Revolvers, cs.....	1	



to all other descriptions of finished iron, it seems unnecessary to go into further details. The demand is enormous, and business during the balance of the year promises to be the heaviest in the entire history of the trade. Manufacturers are doing their utmost to make deliveries on time, and are also disposed to keep prices within safe limits. If they are in a position to accommodate a buyer at all, they endeavor to do so at moderate prices, and if a sale is not made the difference is seldom because of price. In a general way the following may be considered fair average prices, say: 2.7¢ for Angles, 3.3¢ for Beams, 3.4¢ for Channels, and 3.5¢ for Tees; 3.25¢ for Tank Iron, 3.75¢ for Reamed, 4¢ for Shell, 5¢ for 5½¢ for Flange, and 6¢ for 6½¢ for Fire-box.

**Sheet Iron**—Is active and in light supply at about the following prices:

Common Sheet, No. 22 to 24..... 35¢  
Common Sheet, No. 24 to 26..... 40¢  
Common Sheet, No. 26 to 28..... 45¢  
Best Reamed ½¢ @ ½¢ advance on the above.  
Best Bloom Sheets, No. 22 to 24..... 75¢  
Best Bloom Sheets, No. 24 to 26..... 80¢  
Best Bloom Sheets, No. 26 to 28..... 85¢  
Common Red Plates, 3-16 to 16..... 3-50  
Blue Annealed, 3-16 to 16..... 3-75  
Best Bloom Galvanized, discount..... 35¢  
Second quality, discount..... 45¢

**Wrought Iron Pipe**—There is a large business doing, and prices are firm at 40¢ discount for Boiler Tubes, and 65¢ for Gas and Steam Pipe.

**Steel Rails**—The demand is more urgent, and prices are again a shade higher. Sales have been made at \$60 @ \$62.50 for fall delivery, but the supply is quite inadequate, and offers of \$60 have been declined for large lots. For next year's delivery \$58 @ \$60 is asked, and it would be difficult to shade prices unless deliveries were unusually favorable to the seller. One or two large lots have been taken lately (on old offers) at about \$56, but quotations to-day would be at least \$2 higher, and manufacturers are not seeking business, as there is a general impression that prices are going to be higher before the demand is entirely satisfied. Street Rails are in demand, and sell freely at about \$70. English Rails are also a shade dearer, and would cost \$60 @ \$62.50, according to time and port for delivery. Large sales have been made lately for the Canada Pacific Railway, for shipment via Chicago, and for roads on the Pacific Coast, for shipment via San Francisco.

**Steel Blooms**—A small lot sold at \$44, for shipment to New York, and negotiations are pending for several thousand tons additional, but buyers are not prepared to pay the extreme price quoted. The demand is quite active, however, and a good deal of business is likely to be done at a basis of about \$43 @ \$44, duty paid.

**Iron Rails**—The market is rather quiet, and although there are some inquiries, no large amount of business seems to be accomplished. The asking price is about \$47.50 @ \$48 for heavy sections, and for small lots these rates are readily obtained. For large lots, and at convenient date for delivery, concessions could possibly be obtained, but there is no great anxiety for business on either side, although manufacturers are rapidly reducing their engagements, and will probably be in the market as sellers in course of thirty or sixty days. Light sections command \$50 @ \$52.50. English 50s are nominally about \$45, but there is very little demand.

**Railway Supplies**—The demand is very active, and all descriptions are held at slightly higher prices. Some large sales have been made at about: Spikes, 2.85¢; Fish Plates, 2.4¢ @ 2.5¢, and Bolts and Nuts, 3.25¢ @ 3.75¢.

**Crop Ends**—Are nominally about \$26.50, but we have not heard of any recent transactions. For shipments bids of \$27 are asked for, but there is very little demand at present.

**Scrap Iron**—There is a fair demand, and prices are about steady. Choice No. 1 would command \$30 @ \$31; Medium about \$29, and Cast, \$20.

**Old Rails**—There is very little change to note, and, although there is not much demand, prices are firmly maintained. A lot of about 1000 tons of 1½" sold at auction to-day brought \$27.50, in store, which appears to be about the usual market rate. For shipment \$28 is named, and business will probably be done at that figure in course of a few days. Doubles are scarce and nominal at about \$30. There is nothing clearly defined in the Old Rail market beyond the fact that holders refuse to make concessions, and consumers are equally determined not to anticipate future requirements at present prices.

**Coke**—Prices are steady and unchanged at \$1.60, free on cars at ovens; small Foundry orders at about \$1.70. Cars are scarce, and some annoyance is felt because of the difficulty of making prompt shipments.

**Nails**—The market is very bare of stock and prices are very firm at \$3.15, less the usual trade discount.

**Old Car Wheels**—Are held at \$29 @ \$30, according to make, and are firm for desirable quality.

## PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, Pittsburgh, Pa., Sept. 5, 1881.

**Pig Iron**—There has been very little change in the general position of the market during the past week; while there is an absence of excitement, and there are but few large sales being effected, there is a very fair volume of business, and it could be considerably increased if producers were willing to contract for future delivery at the prices now ruling. While some furnacemen are apprehensive that a further advance might bring them into competition with foreign irons, others are of the opinion that prices can be pushed up a dollar, or even more, with safety. That in view of the large and increasing consumption, there will be no difficulty in disposing of the production during the remainder of the year, and that, too, at an advance. Owing to the extreme heat, but very few of the puddling furnaces have been worked to anything like their full capacity for some time past, and just as soon as the weather becomes cooler, the consumption

of Pig Iron will be largely increased; and then another strong point, urged by those who want higher prices, is that stocks in first hands are comparatively small, the great majority of the furnaces in blast being not only out of stock, but sold from one to three months ahead. We repeat former quotations: Forge Irons from native ores, \$22 @ \$22.50, 4 mos., and from Lake ores, at \$23 @ \$24. Sales of the latter at \$23.50 @ \$23.75, cash, for good strong Neutral, inclined to Red-short. Foundry Irons, \$23.50 @ \$24 for No. 2, and \$25 @ \$25.50 for No. 1.

**Bessemer Iron**—There is considerable inquiry, and the market is steady; sales at \$27, 4 mos., for Domestic, and \$28, cash, for English—the latter deliverable in Pittsburgh.

**Muck Bar**—There is no abatement in the demand, and, with very little offering, the market is reported firm. While we have heard of no sales above \$40, cash, and \$41, 4 mos., it is intimated that 50¢ per ton more could be obtained for a good quality for immediate delivery. Nearly all the mills have been consuming more than they have produced for some time past; hence the stock accumulated in the spring has been absorbed, and there is a good deal wanted, with very little to be had.

**Manufactured Iron**—There is no let up in the demand for all kinds of Manufactured Iron, and but for the fact that it is well known that the mills generally are unable to book anything for delivery this side November or December, there would be a great many more orders on the market than there are. Merchant Bars are still quoted at full card rates, \$2.50, 60 days, 2¢ off for cash, but higher rates could be obtained for early delivery. We are cognizant of an offer to pay \$2.60 rates for 100 tons per month from now until the close of the year—400 tons—and no one could be found to take it. So in regard to Sheet, Tank and all other kinds. A broker informed your correspondent yesterday that he had been out all day trying to place an order for Sheet, but was unsuccessful—could find no one in condition to take it. The production of all the mills has been very much curtailed for some time past by the hot weather, and they are nearly all working on old orders, some of which were taken at prices considerably lower than those now ruling.

**Nails**—There has been a decided improvement in the Nail trade at last. Orders have commenced to come forward freely, and some makers report that they have as much as they can do. We repeat former quotations: \$2.85, net cash, for carload lots and upward.

**Wrought Iron Pipe**—The mills here, and we have no doubt it is the same elsewhere, are pressed with orders, and are so busy that they scarcely know which way to turn. Prices have again been advanced, and discounts are now quoted at 5½¢ @ 60¢ on Gas and Steam Pipe; Boiler Tubes remain unchanged at 40¢. Oil-well Casing and Tubing have advanced to 82½¢ and 24¢ per foot, net.

**Rails, &c.**—Steel Rails for near-by delivery are quoted at \$62 @ \$63, cash, at mill, and for next year at \$60. Railway Spikes remain unchanged at 3¢, 30 days; Splice Bars, 2.45¢ @ 2.55¢; Track Bolts, 3.40¢ @ 3.60¢.

**Steel**—The demand continues to increase, and the indications now are that the mills will be pushed to their utmost capacity during the remainder of the year. We quote: Best brands of Reamed Cast Steel, 11¢; do. Crucible Machinery, 7¢; Bessemer and Open-hearth do., 5¢ @ 5½¢; do. Spring, 4¢ @ 4½¢; do. Plow, 4½¢ @ 4½¢. Standard brands of homogeneous Boiler Plate, 6½¢ @ 6½¢.

**Scrap**—There is an increasing demand for some kinds, while others continue dull; prices firmer, but without quotable change: Wrought Scrap, \$23 @ \$29 per net ton for Ordinary, and \$30 @ \$31 for Selected Railroad. Old Car Wheels: There have been sales within the past week at \$30 per gross ton. Crop Ends still quoted at \$30 @ \$31 per gross ton; Car Axles, \$35 @ \$37; do. Springs, \$38 @ \$40; Wrought Turnings, \$19 @ \$20; Cast Boring, \$16 @ \$18, gross.

**Window Glass**—Business is commencing to boom up. Letters from traveling salesmen who have gone West, report stocks in the hands of jobbers very much reduced and that the outlook never was better for an active fall trade. Prices unchanged. We continue to quote discounts at 60 and 20¢ on single and 70¢ on double strengths. Stock in first hands small—but few firms have anything like an assortment.

**Coke**—The activity noted for several months has continued, and but for the scarcity of cars the volume of business would be considerably increased. Those operators who have their own cars are, as might be expected, in much better condition than those who are depending upon the railroads for cars. Prices remain unchanged at \$1.60 per ton, free on cars at ovens, and \$1.70 @ \$1.75 for small foundry orders.

**Coal**—In consequence of the continued suspension of navigation, business in the Coal mines in the Monongahela Valley continues quiet; all the Coal craft is loaded and lying waiting for water. In the down river markets prices continue to advance; 17¢ per bushel retail in Cincinnati.

## CHICAGO.

Office of The Iron Age, 36 and 38 Clark Street, Chicago, Sept. 5, 1881.

**Pig Iron**—The only new feature we have to note in this market since our last writing is that the lower grades of Pig seem to be in greater demand than heretofore, in fact more so than the better qualities. Quotations are firm and market strong. We quote: Crane X, \$28; XX, \$26; Thomas, \$25.50 @ \$28.50; Scotch Imported, \$27 @ \$29; American Scotch, \$25 @ \$28; Silvery Soft, \$23 @ \$25; Lake Superior Charcoal, Nos. 1 and 2, \$33; No. 3, \$32; Nos. 4, 5 and 6, \$34 @ \$35.

**Manufactured Iron**—We have no change to note in Manufactured Iron; prices are firm and the demand excellent, for which the supply is still inadequate. We

quote: Bar, 2.70¢ in store and 2.60¢ at mill; Angle, 3.50¢; T, 3.70¢; Hoop at 3.30¢ rates; Sheet, Plate and Tank, 10 to 14 gauge, at 3.80¢ @ 4¢. The supply of this class of Iron here is light. Dealers who have fair stocks state that they can realize even better prices than those quoted.

**Nails**—Nails continue to be in good demand at \$3.15 per keg in less than carload lots, with the usual discount off, but good brands may be had from \$3 up.

**Steel**—The demand for Tool machinery and Steel for agricultural purposes for the past month has been satisfactory to dealers. We quote: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢; and O. H. Spring, Tire and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5½¢; Iron Center Plow, 10½¢; and soft Steel Center Plow, 10½¢.

**Scrap Iron**—Scrap Iron is in fair demand, with no change in prices. We quote: No. 1 Forge Scrap, \$30; No. 1 Wrought, \$24; Heavy Cast, \$20, and Stove Plate, \$13.

## CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., Chattanooga, Sept. 5, 1881.

Business is excellent for the time of year and prices satisfactory. Our manufacturers have constantly pressed upon them orders for future delivery at present quotations. Any or all of them could sell ahead three or four months to good parties; but they prefer to do a closer business and take what may come of advance in prices for themselves. The week's business is reported as more than double that of the corresponding week last year. The weather, though still warm, is more favorable for active work.

**Pig Iron**—The market continues in a strong, healthy state. The product is not above the demand. High grades are scarce still and very strong. We quote: No. 1 Foundry, \$22 @ \$23; No. 2 Foundry, \$20 @ \$21; Gray Forge, \$18 @ \$19; White and Mottled, \$16 @ \$18; Car-wheel Metal, \$38 @ \$40.

**Ores**—We quote: 50¢ Brown Hematite, per ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25.

**Miscellaneous Articles**—Old Rails are still fairly strong at \$26 @ \$28; Wrought Scrap, \$20 @ \$22; Cast Scrap, \$10 @ \$15; Old Wheels, \$23 @ \$30. Scraps are dull and little sought.

**Nails**—The demand is very sharp and prices are well maintained. Job lots go at about \$3 @ \$3.10. Larger orders a little less. The mills in the district are full of orders.

**Manufactured Iron**—Bar Iron is strong at \$2.50 for small lots from mill or store. Larger orders get light discounts. We continue to quote: Spikes, \$3.15; Track Bolts, \$4; Trestle Bolts, \$4.50; Fish Plate, \$2.75.

**Coal**—Dealers and miners complain that they cannot get cars with which to transact their business fully. This trouble is retarding one or two new furnaces from blowing in. We quote run of mine at \$2 at mill.

**Coke**—Continues scarce. It would hardly be possible to secure the needed amount to supply a stack of any size. We quote: Furnace Coke, \$3 per ton at furnace; Foundry, 10¢ @ 12¢ per bushel.

**Steel and Iron Rails**—Steel Bars, \$62 @ \$74 at mill; Iron, \$50 @ \$52; Small, \$57 @ \$60.

## BOSTON.

SEPTEMBER 3.—The somewhat anomalous condition of the Iron trade and market continues, with the difference between Pig and Manufactured Iron still more strongly accentuated. The manufacturers of Rolled Iron have had rather a hard time of it for quite a long season, and the sudden reversal of the situation is rather confusing. There is no farther advance in crude Iron, while all Manufactured Iron seems gifted with indefinite powers of rising. There can be no doubt that foreign holders of Iron are looking with much anxiety for an opening to ship some portion of the enormous stock on hand at the Iron centers and ports in Great Britain. Holders and manufacturers of Pig Iron in this country, though not overstocked, believe that the present wild rush for Rolled Iron will last only until the mills can, by hard work, catch up with the sharp demand, and hence are not disposed to press for an advance to correspond. The approach of cold weather will put a stop to some of the outdoor operations which demand large quantities of Wrought Iron, and the desire is general in all branches of the trade to tide over the rush and keep the business in their own hands. American Pig—There is no quotable advance in American Pig Iron, though holders are firm at quoted rates, at shipping ports: \$24.50 @ \$25 for No. 1 X; \$22 @ \$23 for No. 2 X, and \$21 @ \$21.50 for Gray Forge. Small spot lots command \$2 @ \$3 per ton above these quotations.

**Foreign Pig**—A good business has been done in Foreign Pig Iron, one sale, 500 tons of Langdon, being reported at very slight shading from quotation. We quote: Eglinton at \$21 @ \$21.50; Langdon, \$24.50 @ \$25; Garbathrie, \$22 @ \$23; Glengarnock, \$22.50 @ \$23.50; Carnbroe, \$22 @ \$23. Old Rails are unchanged and in small supply. We quote American at \$32 and Foreign at \$30.

**Manufactured Iron**—The rush reported for the past fortnight in Manufactured Iron continues, with increasing pressure upon the capacity of the mills. Prices to a great extent are nominal, except for small lots which can be immediately delivered. It will require from 60 to 90 days for the mills to catch up with the orders already booked, and thus restore order and steadiness of prices. The manufacturers are more anxious that prices should hold steadily as they are, than that they should still farther appreciate. No prices are made or contracts entered into for future deliveries. Much of the demand is for the purpose of fulfilling contracts in the way of construction, and consumers are willing to go beyond the market, if, by so doing, they can secure deliveries. It is the absolute absence of

stock which causes the irregular and excessive prices which are offered and refused. Some manufacturers are disposed to raise their prices until orders are stopped, and others to refuse all contracts at any price. They are afraid of getting full of orders at high rates, and thus producing a general demand for an increase of wages and consequent disorganization and delay of production. We hear of contracts for extra hands extending far into the winter as high as \$2.70, and refusal to accept further contracts at their price; though this is of course exceptional. The smaller customers are put off with one-half or one-fourth of their orders, in order to nurse the depleted stocks and retain business. The failure of the Ligon Iron Co. at Portland has thrown a large portion of the Eastern trade upon the Boston supply, and still further increased the pressure upon the manufacturers. The advances of the past week are noted in our quotations, the special feature of which is the rise in prices of plate iron. Bar Iron—

We quote Refined at \$2.50 for large lots and \$2.60 to small buyers; Horse Shoes, \$4.25 @ \$4.33; Swedish and Norway at \$3.75 @ \$4 for Bars, and \$4.75 @ \$5 for Shapes. Plate Iron has made a sharp advance, with active demand and short supply. We quote: Tank at \$3.35; Refined at \$3.45; Shell at \$4.10; Flange at \$5.10, and Tubes unchanged at 40¢ discount from list. Sheet Iron continues active at unchanged prices. We quote: Sheet Iron, 4¢ @ 4½¢; ditto Refined 5¢ @ 5½¢; Galvanized, 8¢ @ 10¢; Russia, 11¢ @ 12¢. Steel is in good demand at unchanged prices. We quote Best English Cast, 14¢ @ 15¢; American ditto ditto, 12¢ @ 12½¢; Bessemer Machinery, 5¢ @ 6¢; Wedge and German, 7¢; English Spring and Calking, 7½¢ @ 7½¢; Tire, 4¢ @ 4½¢; Sleigh Shoe, 3½¢. Nails—Very large trade is reported at \$3.05, net, per case. Other Metals—The trade in the superior metals is fair, with upward tendency.

**Copper**—We quote: Ingot Copper at 16½¢ @ 16½¢; Sheathing, 24¢; Braziers, 26¢; Bolt, 25¢; Copper Bottoms, 29¢; Yellow Metal, 17¢; Yellow Firm Bolt, 20¢. Lead—Pig Lead is very firm at quotations, the supply being short. We quote: 5½¢ in car lots and 5½¢ in small orders; Bar, 7¢; Pipe, 7¢; Sheet, 7½¢; Tin-lined Pipe, 15¢; Tin Pipe, 35¢ less 10¢. Spelter is reported scarce and firm at unchanged prices. We quote \$5.25 by carload. Small lots \$5.50 @ \$5.75. Zinc is in fair demand at 7½¢ @ 7½¢. Tin—Business moderate at quotations. We quote Straits at 21½¢ and English at 22¢. Tin Plates—We quote: Charcoal Bright at \$6 @ \$6.25; Terns at \$5.62½ @ \$6; Cokes, \$5.50 @ \$5.55; ditto Terns, \$5.62½ @ \$6.—Commercial Bulletin.

## LOUISVILLE.

Messrs. GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of Sept. 2, 1881: The market looks very healthy and there is a quiet, steady demand for Foundry grades. There is no change in our prices, which are for cash:

**FOUNDRY IRONS.**  
No. 1 Hanging Rock, Charcoal..... \$27.00 @ \$30.00  
No. 2 Southern, Charcoal..... 25.00 @ 27.00  
No. 3 Hanging Rock, Stonecoal and Coke..... 22.50 @ 23.00  
No. 4 Hanging Rock, Stonecoal and Coke..... 21.50 @ 22.00  
No. 5 Southern, Stonecoal and Coke..... 21.50 @ 22.00  
No. 6 American Scotch..... 21.00 @ 22.00  
No. 7 Silver Gray..... 20.00 @ 21.00  
No. 8 Hanging Rock, Cold-short and Neutral..... 19.50 @ 20.50  
No. 9 Stonecoal and Coke, Cold-short and Neutral..... 18.50 @ 19.50  
No. 10 Missouri and Indiana Red-short..... 25.00 @ 27.00  
White and Mottled, Cold-short and Neutral..... 17.00 @ 18.00

**CAR WHEEL AND MALLEABLE IRONS.**  
Hanging Rock, Cold-blast..... 35.00 @ 41.00  
Alabama and Georgia, Cold-blast..... 35.00 @ 40.00  
Kentucky Cold-blast..... 35.00 @ 40.00  
Hanging Rock, W. B..... 29.00 @ 33.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of Sept. 3: Merchant Bar still continues firm and in short supply. There are, however, some signs of easiness for future deliveries. We are credibly informed that English Bars can be imported and laid in store in New Orleans at 2.42¢ card rate. If this be so, then 2.50¢ Iron at river mills will not be in demand at that market as soon as imports begin. The extreme heat and scarcity of water in certain localities is interfering with production. Sheet Iron is still scarce, and the common grades are selling up to charcoal prices. Nails are decidedly firmer, as old contracts have pretty well run out and new supplies must be put in by rail at an advanced rate of freight. Despite the distress occasioned by lack of rain, trade continues remarkably brisk.

## BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports to us the following, under date of Sept. 5: Business continues ruling active and buoyant, with continued short supplies for leading sizes. Values remaining firm and unchanged at last quotations:

Ref. Bar Iron, 1 to 6 x ½ to 1..... 2 ½¢ @ 2 ¾¢  
" " " 1 to 4 x ½ to 1..... 2 ½¢ @ 2 ¾¢  
" " " ½ to 1, Round..... 2 ½¢ @ 2 ¾¢  
Hoop Iron, 1½ wide and upward..... 3 ½¢ @ 3 ¾¢  
Band Iron, from 1½ to 4 in. wide..... 3 ½¢ @ 3 ¾¢  
Horse-shoe Iron..... 3 ½¢ @ 3 ¾¢  
Norway Nail Rods..... 6 ½¢ @ 6 ¾¢  
Black Diamond Cast Steel..... 13 ½¢ @ 14 ½¢  
Cast Spring Steel..... 8 ½¢ @ 8 ¾¢  
Common Horse Nails..... 10 @ 14 ½¢  
Perkins' Horse shoes ½ keg of 100 lbs..... \$4.37½  
" Mule shoes..... 5.37½

R. C. HOFFMAN & Co., Iron and Commission Merchants, report the Pig Iron market as follows, under date of Sept. 6: We have no change to note in the Iron market. Demand active and prices unchanged. We quote:

Baltimore Charcoal Wheel Iron..... \$36.00 @ \$38.00  
Virginia C. B. Wheel Iron..... 36.00 @ 38.00  
Anthracite No. 1..... 25.00 @ 26.00  
" No. 2..... 23.00 @ 24.00

No. 3..... 21.00 @ 22.00  
Mottled and White..... 19.00 @ 21.00  
Charcoal C. B. Blooms..... 60.00 @ 62.00  
Refined Blooms..... 55.00 @ 60.00

## RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of Sept. 5: The Pig Iron market for the current week has been fairly active and firm at the following prices:

Scotch Pig Iron..... 23.00 @ 25.00  
No. 1 Anthracite Pig Iron..... 23.00 @ 25.00  
No. 2 "..... 21.50 @ 23.50  
No. 3 "..... 20.50 @ 22.00  
No. 1 Virginia Coke Pig Iron..... 23.00 @ 24.00  
No. 2 "..... 22.00 @ 23.00  
No. 3 "..... 20.00 @ 22.00  
Virginia Charcoal C. B..... 34.00 @ 36.00  
Old Rails..... 27.00 @ 29.00  
Wrought Scrap, No. 1..... 28.50 @ 30.00  
Cast Machinery Scrap..... 20.00 @ 21.00  
Refined Bar Iron..... 25.00 @ 26.00  
Horse Shoes (Tredgill)..... 4.00 @ 4.50  
Mule..... 5.00

## ST. LOUIS.

Messrs. HOFFER, PLUMB & Co., Pig Iron and Iron Ore Merchants, 417 Fine street, write us, under date of Sept. 3: Under the stimulus of the good demand, which has existed lately, makers' views have advanced somewhat. Prices now are:

**HOT BLAST CHARCOAL.**  
Missouri..... \$27.00 @ \$27.50  
Southern..... 24.00 @ 25.50  
Ohio..... 25.00 @ 26.50

**COKE AND COAL.**  
Missouri..... 26.00 @ 27.00  
Southern..... 24.00 @ 25.00  
Ohio..... 25.00 @ 26.50

**MILL IRONS.**  
Cold-short..... 21.50 @ 22.00  
Red-short..... 24.00 @ 25.00

**CAR WHEEL AND MALLEABLE IRONS.**  
Missouri..... 28.00 @ 30.00  
Southern..... 25.00 @ 26.00  
Ohio..... 22.00 @ 23.00

## Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Aug. 22, 1881.

## TRADE PROSPECTS.

here do not appear to have become appreciably brighter of late—indeed, in some respects we seem to have experienced a distinct sort of retrograde movement during the past fortnight. This I think has been owing for the most part, to the broken weather, which has inflicted great damage upon the corn crops and seriously spoiled our harvest prospects. Up to a fortnight or thereabout ago we had had one of the finest and driest summers on record. The spring was very dry and cold, and the early summer excessively hot. All this was good for the wheat, and we had begun to build up our hopes in the most sanguine style. As a matter of fact, a fair breadth of corn was reaped and harried in good condition in the South and South-east, where the crops are always a fortnight or so earlier than those north of London, but throughout the Midlands, West, East and North the rain has come just as the wheat is ready for the reapers, or just as it is being cut. Storms almost daily have caused much of this cut corn to sprout, or have induced mildew in the standing crops, so that all our high spirits have disappeared, and we are once more confronted with a poor, thin and deficient harvest. On the whole, the result will be, I should say, quite 30 per cent. below the anticipations formed a month ago, when the corn crops were estimated to be about 10 per cent. under a good average. As I have had occasion to remark in former letters, this is a matter of which the importance cannot be overrated. If the weather should continue wet and uncertain, the farmers will receive a knock-down blow, from the effects of which hundreds of them will never recover in a financial sense. Already we have an enormous decrease in the area of land under wheat—a million acres, I believe, writing from memory. Thousands of acres cannot be let at any price, and some of the best land in this or any other country cannot be sold. This is a truly alarming position, and one which must sooner or later attract the attention of our statesmen. When I say "attract the attention," I mean in a practical way, with the promise of legislation. I assume our agriculturists have a sort of right to exist; yet it is a fact beyond dispute that, so far as wheat-growing is in question, they cannot grow it, even if they have their lands rent free. Turning, now, to the iron trade, I find little that is new and interesting. Almost all the open markets have ruled dull and quiet during the week, the leading characteristics of which have been small sales and a general indisposition to move ahead. The enormous stocks of pig iron still cripple that branch of the trade and render any recovery of prices entirely out of the question. In some of the finished iron departments, on the other hand, reports seem to afford indications of increased employment, and in some branches better selling prices. There has been no quotable alteration in market bars, which remain at £7 @ £7.10 for the products of the "list" houses, but some of the lower grades of common bars, including Welsh, have moved up 2/6 @ 5/ per ton, and are decidedly stronger under the influence of a revived call from home and foreign buyers. Hoops and sheets are still in request, as also is galvanized iron. In the last-named line, however, the association formed some time ago has failed to sweep in all the makers outside Staffordshire, and these are again underselling their inland brethren, and so securing the Colonial orders. The vendors of black sheets quote £7.15/ for singles, £8.10/ for doubles and £9.15/ @ £10 for lattens. Hoops are £6.10/ at which price several good orders from the United States are said to have been secured by houses in Lancashire and North Staffordshire. For fencing and other wire some of the Birmingham, &c., makers have attempted to secure a rise of 5/ per ton, but their efforts in that direction are understood to have met with small success. Much of the Australian trade in fencing wire is drifting into the hands of



he fires at the Star Glass Works, Norris-  
n, have been started and blowing will  
in this week.



# DRILL BRACE.



This is a 10-inch sweep Brace, with a gear-wheel speeded about three to one, to be used for drilling and also for boring in places where there is not room to revolve the Brace Sweep. By an ingenious device the large gear wheel can be put on at three different angles with the Brace Sweep, adapting it for use in narrow or cramped places. When not needed the gear wheel can be removed in one second, leaving a plain Brace. This Brace is made of steel, and is heavily nickel-plated, with rosewood handle and lignumvitæ head. The jaws are of forged steel and will center and hold firmly Round Twist Drills from 1/4 to 7-16 of an inch in diameter. Also, Square Shank Bits and Drills of all sizes. Also, Square and Flat Screw Driver Bits. In fact, it will hold perfectly tool shanks of any size or shape. There is no other chuck in existence which will do this. It is our purpose to furnish everything in the line of Bit Braces and Breast and Hand Drills of a style and quality superior to anything else in the market.

Price of Drill Braces per dozen, \$36.

Same discount as Breast Drills.

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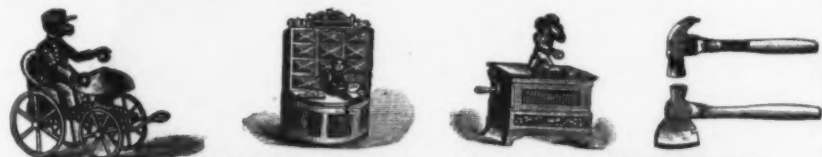
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Also a large line of Heavy and Shelf Hardware.



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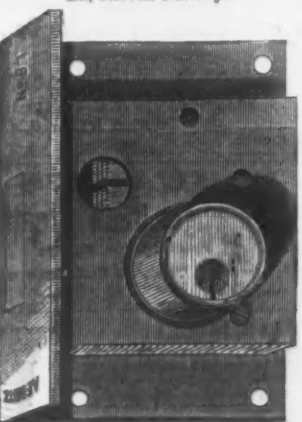
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The Greatest Invention  
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It has no ratchets or  
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thus allowing entire free-  
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tirely of iron; is easily  
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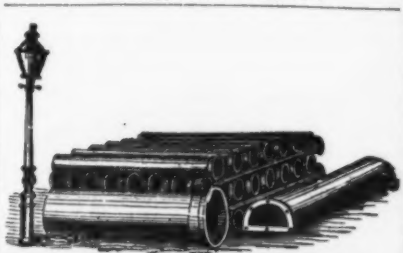


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Protect them from wearing and are  
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Patentee and Sole Manuf'r in U. S. and Canada,  
Northville, Fulton Co., N. Y.



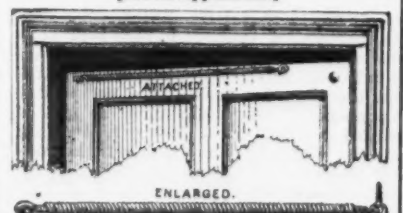
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Costs less, and surpasses in Simplicity  
Durability and Perfection all other  
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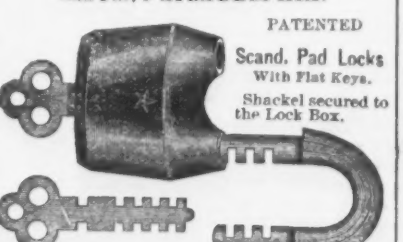
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OUTSTRIPS ALL COMPETITORS. PREMIUMS TAKEN OVER ALL OTHER MOWERS.  
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Save \$2 to \$3 each year in ex-  
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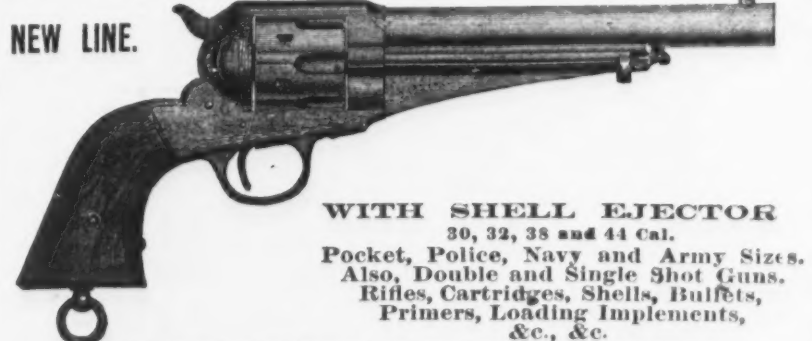
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## PITTSBURGH AND VICINITY.

The new rail mill of Messrs. Carnegie, Floman & Co., which has been erected at Homestead, will be put in operation this week. It will be used for the manufacture of steel rails. Many of the best men employed heretofore at the Superior Rail Mill will go to work in the new mill.

Those iron mills which derive their water supply from the Monongahela River are experiencing great inconvenience on account of the very low water.

Work will be resumed this week in the window glass factories of the Pittsburgh district, after a stoppage of three months. The resumption takes place under the most favorable circumstances.

Wm. McCully & Co. will start their new prescription house, on Twenty-eighth street, on September 1. Both furnaces are fired up, one to start blowing on September 1 and the other on September 5.

Wightman's glass factories, in the Thirty-sixth ward, will resume work on Thursday. Both factories have been thoroughly overhauled and repaired.

A. Garrison & Co., of this city, are engaged upon the manufacture of a train of rolls for the new iron mill at Pueblo, Colorado, the first iron mill in that State. All the roll makers in this city are overwhelmed with orders for rolls and their appointments.

The Pittsburgh Locomotive Works are running double turn on large orders from Western railroads.

The Connellsville Coke Company is shipping ten carloads of coke per day to California, via the Union Pacific Railroad.

The Flint bottle house of Agnew & Co. have about completed their repairs and improvements at Hulton Station, and were to commence operations on Monday, September 5. The outlook is very favorable.

Six new lathes of an improved pattern were set up in the machine shops of the American Iron Works yesterday. Owing to the press of orders the men in this department of the mill are working 13 hours a day.

Work on the large new plate and sheet mill of Moorhead & Co., at Soho, is progressing rapidly. The fly wheels and rolls are in position and other work is being pushed rapidly.

The Dithridge Chimney Company have removed all their chimney-making apparatus from their factory at the foot of Seventeenth street to the co-operative factory at Phillipsburg, P. & L. E. R. R. The reason assigned for the change is that taxes are lower and material cheaper at Phillipsburg than in this city.

## OHIO.

The Farmers' Friend Grain Drill Manufactory, at Dayton, caught fire on the 1st inst. The fire was discovered in the paint room, and the entire fire department was called out. At midnight the flames were under control, and the loss is variously estimated at from \$30,000 to \$35,000. The building was stocked with materials. It is one of the largest drill manufactories in the United States, employing 200 men, who have been working day and night. The fire was confined to the third and fourth stories, and the damage may prove smaller than now estimated. Insured for \$10,000.

The Hagerstown Agricultural Implement Company have sold out to a company in Newark, where the business will hereafter be carried on.

Vernon Furnace is running very evenly, making 12 to 14 tons choice car-wheel iron daily.

Hecla and Howard furnaces have stopped running on account of scarcity of water.

It is expected that Youngstown will shortly have another rolling mill. A party of citizens, among whom are George James, Oliver William and Adam Summers, all skilled in the manufacture of sheet iron and heavy plated iron, have been engaged in making arrangements for the building of the mill. Several capitalists in Niles heard of it, and made a proposition for them to locate it in Niles. It is thought, however, that the mill will be located here. The gentlemen named will manage the mechanical part of the business. The works will be located on the McCurdy farm. The new concern will be known by the name of Summers Bros. & Co.—Pittsburgh Dispatch.

Alice Furnace will probably be banked in a few days to await a rise in the river, as the present shipping facilities will not put the iron in the market fast enough, and they do not wish to accumulate stock.

## ILLINOIS.

A 15-pot glass factory is building in Ottawa, to be operated by a number of workmen from Pittsburgh, who have been looking for a location in the West for some time.

Chas. F. Elmes, manufacturer of coal-mining machinery, Chicago, has on hand a large number of contracts which will keep his establishment in operation to its full capacity for the next six months.

The Thorn Wire Hedge Co., Chicago, manufacturers of the Kelly steel barb wire, are building six more automatic barbing machines, to be used in their works.

Sherman & Marsh, proprietors of the Lyman Manufacturing Co., Grand Crossing, have had their limit increased 1000 tons a year. They are employing 60 hands in their works, which are run on full time, and now turn out 400 tons of barb wire a month.

The Payson Manufacturing Co., Chicago, have for the past two weeks been running their works extra hours, turning out sash locks and casters. They are employing 26 men.

## TENNESSEE.

Work on the Warner Furnace, Hickman County, is progressing rapidly. Large quantities of coal and ore are in readiness, and the furnace will be put in blast early in November.

The new car-wheel foundry at Knoxville, with Col. A. L. Maxwell at the head, will begin operations in a short time.

## GEORGIA.

The Georgia Iron Works are running full time with a crew of negro workmen, who are doing good work. The concern has plenty of orders.

The machinery of the car factory at Cartersville has been put in working order,

and the concern is now about ready for business.

The Columbus machine shops are building two locomotives for the Central and one for the Mobile and Girard Railroad.

## KENTUCKY.

All departments of the Norton Iron Works are now in full blast, making the usual amount of pig iron and nails. Shipments of nails are now being made almost exclusively by rail, some two or three carloads being shipped daily.

The Ashland Furnace still continues in splendid working condition, and has been putting out over 50 tons of iron per day, using, as formerly, raw coal as fuel.

## MISSOURI.

We clip the following from the *Age of Steel*: The Standard Tool Company are erecting, as an addition to their works on Souland street, a \$1000 iron-clad forge shop. The rolling mills of the St. Louis Stamping Company, having been thoroughly overhauled, have again been put in operation. The Mississippi, the St. Louis and the Lindell Glass Works were to have resumed work on Thursday after their usual summer vacation. Rohan Bros. are full of work, and employ 200 workmen. They are putting six new steel boilers in the transfer steamer Chickasaw, and seven in the works of the St. Louis Distilling Company. The Brownell & Wight Car Company are making considerable enlargement of their works, which, when completed, will give them facilities for turning out completed street cars at the rate of one a day. It will be remembered that the management of the St. Louis Bolt and Iron Company, whose works are located on the opposite side of the river, and the Tudor Iron Company, whose works were in the southern portion of the city, near the arsenal, are substantially under one management. The machinery of the Tudor Works has been removed to the Bolt and Iron Company's works, where it has been erected and is now in operation.

Messrs. Frank G. Hopkins & Co., wholesale dealers in firearms, of St. Joseph, have made an assignment. The Parker Gun Company, of Springfield, Mass., and Messrs. John C. Moore & Sons, of New York, are among the creditors. It is expected that their assets will satisfy nearly all liabilities.

## MICHIGAN.

The following table exhibits, in gross tons, the total lake shipments of iron ore the present season, up to and including Aug. 24, together with the amount shipped during the corresponding period last year:

Where from.	1880.	1881.
Escanaba.....	711,677	841,183
Marquette.....	490,129	400,066
L'Anse.....	32,353	29,494
Total.....	1,234,159	1,270,743

An increase of 116,879 gross tons. In addition to this, pig iron, ore and quartz were shipped as follows:

Pig Iron.	1880.	1881.
Carp River Iron Co.'s furnaces.....	4,739	922
Pioneer Furnaces.....	922	5,641
Total pig iron.....	5,641	5,641

Quartz.	1880.	1881.
Carp River Iron Company.....	3,577	15,793
Ore to local points.....	15,793	25,511
Total ore, pig and iron and quartz.....	25,511	25,511

—Marquette Mining Journal.

The Excelsior Furnace, at Ishpeming, which was burned some months ago, has been repaired, and will probably be blown in this week.

The Delroy Glass Works, at Detroit, were burned down on Saturday, the 3d inst., the establishment being a total loss. Seventy men were employed, who are now idle. The works had been idle since July 1, having been enlarged and fitted up in excellent shape and thoroughly equipped. In the meantime the men all had been got together again and had put in the first melting. Loss, \$40,000 to \$50,000; insured for half that amount. The works will be immediately rebuilt of brick and iron, and it is hoped to get them ready by the opening of winter.

Carp Furnace and the Rolling Mill Furnace at Ishpeming, are running steadily and doing good work.

Martel Furnace was blown in Aug. 15.

## Decorative Cut Metal Work.

The perforating of metal for decorative, ecclesiastical and domestic purposes, by means of a machine-saw, is one of the curiosities of Parisian industry. The achievements of the small steel instrument working through dense sheets of metal, one piled on top of another, have been compared by a French critic to the easy action of a knife cutting through a roll of butter. Almost as extraordinary as the facility with which a block of iron, a plate of copper, brass or steel, is ornamented, are the numerous designs and purposes to which metal is applied. There appears to be nothing required, from a memorial brass to a palace gate, from a door panel to a magnificent Gothic window, from a Renaissance jewel box to a fender, that the wonderful little instrument cannot turn out. Some of the smallest articles, such as monograms, can be manufactured almost as minutely as hair-work, and there are branches of flowers for the decoration of plush boxes. Architects have found this remarkable saw a valuable ally in the decoration of modern residences; the whole façade of the Gymnase theatre, which has been completely restored, is ornamented with gilt iron, undertaken by the Société Française, of which Madame Delong is the leader and indefatigable manager. That a woman should have given the first impulse to such masculine work, and that she should have improved it in silence until the Paris Exposition in 1878 brought to light her work, displaying all the different decorative applications of cut-metal work, is a fact of which women may be proud.

One of the branches to the perfection of which much care and time have been bestowed by the Société Française is the coloring of cut-out metal work. It is totally distinct from the polished and engraved metal, of which beautiful specimens are exhibited, revealing a lightness and delicacy that contrast with the solidity of other branches. Colored metal work decorates

cornices, ceilings, &c., representing griffins, arabesques, chimerae, and any style of ornamentation which the taste of the day decrees. The shading is so minute that when any of these colored designs are attached, like applied needlework, to a groundwork of velvet, the visitor naturally supposes this intricate fret-work is merely painting, never suspecting the presence of metal.

Among the latest and most admired achievements of the Rue Bayen Works (Thernes) are two stained windows representing exotic foliage covered with beautiful metal work; and among the most fanciful is a Christmas tree entirely of copper, the branches being Gothic figures that reproduce cathedral sculpture, and which, being pierced with small holes, can hold all the golden fruit of the Hesperides. The extreme end of each branch is the head of an apocryphal bird or animal, dear to builders of the thirteenth or fourteenth century. Among the most important public works executed for the city of Paris are the entrance door of the memorial monument of Bourget, the communion rails and chapel gate of St. Ambrose Church, the communion rails of St. Vincent de Paul, the roses and other decorative metal work at the Gymnase; while private orders of a no less sumptuous nature have been executed for the residences of the Rothschilds, for the late M. Menier's house in the Park Monceau, principally the Byzantine oratory; for the Louvre, a large dry goods establishment; for M. Boissier, the confectioner, and for the Paris residence of the ex Queen of Spain.

## The World's Increase.

According to Mr. Mulhall, the statistician, the world's increase for the ten years from 1870 to 1880 was: Population, 9.76 per cent.; agricultural production, 8.58 per cent.; manufactures, 18.6 per cent.; commerce, 38.2 per cent.; mining, 47.06 per cent.; carrying trade, 53.22 per cent. These figures are for the whole world, including the least progressive as well as the most progressive nations, and excluding only such savage and barbarous people as can be brought within the range of statistics. The advance of the more enlightened nations in wealth has been far beyond what these figures indicate, and it goes without saying that no nation has equalled our own in this respect. According to Frederick N. Newcombe, a very able English statistician, our wealth per head of population increased from \$777 in 1870 to at least \$1000 in 1880, or 28.84 per cent.

Mr. Mulhall's figures do not support the opinion entertained by many people that the rich are growing richer and the poor poorer in consequence of the introduction of machinery. They show that while the increase of agricultural products, chiefly food, has hardly kept pace with the growth of population, the increase of manufactured products has been nearly twice as great, and that of commerce nearly four times as great, as that of population. The plain and unavoidable inference is that the ability of the masses to supply their less urgent wants has been growing very rapidly. The food supply was adequate in 1870, and for that reason it was no larger in proportion to population in 1880. A larger proportion of the world's industrial energy was applied to manufacturing in 1880, because the masses of the people had more means to expend for clothing, furniture and other things not absolutely indispensable. There is no escape from this conclusion, because it is the great body of the people, and not the wealthy alone, that consume the bulk of manufactured products. Mr. Mulhall finds that the average earnings of nations have increased 19.84 per cent. since 1870, and the realized wealth 10.57 per cent., from which it appears that people have both accumulated wealth and increased their consumption.

Public as well as private consumption has largely increased, for Mr. Mulhall finds that the increase of taxation in 1880 over 1870 was 22.34 per cent., and the increase in public indebtedness was 43.39 per cent. Taxation, therefore, has grown 2½ times as fast as population, and 2 1-5th times as fast as realized wealth. This, however, does not give Mr. Mulhall any uneasiness, for he finds that the mere increase in wealth during the decade would pay 88 per cent. of all existing national debts, and that all these debts could be paid in 11 2-5th years out of the available increase of earnings, even if in the meantime they should continue to increase at the rate of 4-4 a year, as they did during the last decade. This calculation, however, should not encourage our towns and cities to incur indebtedness unnecessarily. The tendency to run in debt is altogether too strong, and should be curbed rather than encouraged.

**Immigration Statistics.**—The immigration since January 1 to the present date has exceeded all previous records. In the following table will be found the number of immigrants that have arrived for the eight months ending August 31, during the years 1880 and 1881:

	1880.	1881.
January.....	5,677	8,282
February.....	7,004	9,753
March.....	21,094	27,708
April.....	45,578	59,748
May.....	55,083	76,791
June.....	47,027	66,721
July.....	25,381	34,834
August.....	25,321	33,846
Total.....	228,066	310,485
Increase in favor of 1881.....		82,419

**French Railways.**—In France, last year, 603 miles of railway of various kinds, not including light railways, were completed and opened for traffic, making a total in the country at the end of the year of 14,740 miles, besides 148½ miles of private railways in mines, &c. In the same time 57 miles of light railway were opened, making a total of 1356 miles of line of that class. Algeria had 715 miles of railway in operation at the end of 1880. The expenditure for new railway construction in France in 1880 was about fifty millions of dollars.

Here is something which will furnish food for profitable thought to those who are endeavoring to make it appear that protection

does not protect. One of the most extensive firms engaged in the manufacture of fine dress goods in England is Priestley & Sons, whose works, running 1500 looms, are situated in Bradford. Heretofore fine woolen fabrics, in the shape of ladies' dress goods, have been imported from England, and no special effort has been made to introduce their manufacture into this country. Last spring Mr. Herbert Priestley visited this country, with a view to starting a mill here for their manufacture. During the past summer the newly erected mill property of William Arrott, on Philip street, Philadelphia, was leased and 100 looms put up, where they are now running under the supervision of one of the sons. Another large batch of looms has just arrived from England, and it is said that the firm's intention is to remove their entire English business, erect mammoth mills, and engage in the business upon a large scale. It is understood that their operatives will emigrate very largely and join this American enterprise. Manufacturers consider the move an important one, as it may result in other large English manufacturers starting branch establishments on this side of the Atlantic.

In Brazil the spirit of speculation runs high; money is plenty in Rio, in consequence of several loans obtained in Europe, chiefly by the mortgage of plantations, on which interest charges amount to 12 to 74 per cent. per annum. Besides, the present Minister of Agriculture, who is an ardent supporter of public improvements and domestic industries, is remarkably profuse in his pledges of government credit, although it is known that the revenues of the country cannot possibly meet the ordinary expenditures. There is a fair amount of business doing, but intelligent men are learning to be cautious.

Three patents have been granted to John H. Alker, of Pittsburgh, for dies for making coupling pins. They have been assigned to Jones & Laughlins.

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PREPARED  
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For steep or flat roofs. Applied by ordinary workmen at one-third the cost of tin. Circulars and samples free.

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The most perfect Dinner Pail in the world. Hot coffee for dinner and a Lantern at night. Manufactured by J. H. HAIGHT, Post Chestnut, N. Y. Sent by express on receipt of \$1.00. Agents wanted.

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3d. It is weighted on the bottom with an iron ring to prevent it from tipping, but in case it should be tipped, the funnel extending into the lower half prevents spilling.

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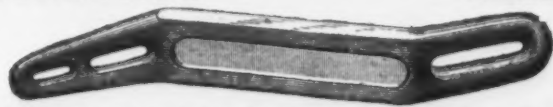
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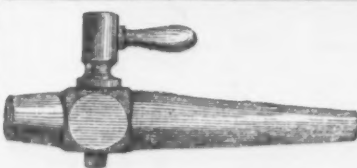
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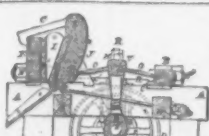
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<b>Butts and Hinges.</b>	American Brass and Steel Co., 125 Chambers, N. Y.	11
	New England Butt Co., 125 Chambers, N. Y.	11
	Rabin Mfg. Co., Montpelier, Vt.	11
	Stanley Works, New Britain, Conn.	11
	Union Mfg. Co., 125 Chambers, N. Y.	11
<b>Carriage Bolts, Manufacturers of.</b>	Columbus Bolt and Nut Co., Columbus, O.	11
	Hallett F. M. & Co., Allegheny, Pa.	11
	Shelton & Co., Birmingham, Ct.	11
	Townsend, Wm., Philadelphia, Pa.	11
<b>Carriage Hardware, Manufacturers of.</b>	Coville C. & Co., New Haven, Conn.	11
	Smith H. D. & Co., Plainville, Conn.	11
	The E. D. Clark & Co., Auburn, N. Y.	11
<b>Carpenter Springs.</b>	Dexter Spring Co., Hulton Pa.	11
<b>Cas Ales.</b>	Roberts A. P. & Co., 26 S. 4th, Philadelphia, Pa.	11
<b>Casters.</b>	Phoenix Caster Co., Indianapolis, Ind.	11
<b>Castings, Iron.</b>	Cheney S. & Son, Hanlin, N. Y.	11
	Ellwell Hardware Co., Bridgeport, Conn.	11
	Hammer & Co., Bradford, Conn.	11
	North Bros., Philadelphia, Pa.	11
	Queen City Machine Co., Limited, Chicago, Ill.	11
	natl. O., 112 Chambers, N. Y.	11
<b>Castings, Steel.</b>	Chester Steel Castings Co., 407 Liberty, Phila., Pa.	11
	Eureka Cast Steel Co., Chester, Pa.	11
	Griffin & Co., 125 Chambers, N. Y.	11
	Paul Stanley G. & Co., Philadelphia, Pa.	11
	Pittsburgh Steel Casting Co., Pittsburgh, Pa.	11
<b>Caulking Irons.</b>	Carver John, 44 North 1st St., Brooklyn, E. D., N. Y.	11
<b>Chains, Manufacturers of.</b>	Bradlee & Co., 85 Richmond St., Phila., Pa.	11
	Reard David, Cleveland, Ohio	11
	Woodhouse & Co., Auburn, N. Y.	11
<b>Chains, Sash.</b>	Horton Thomas & Co., Elizabeth, N. Y.	11
<b>Chisels, Manufacturers of.</b>	Cary & Root, 125 Chambers, N. Y.	11
	Dunbar Bros., Bristol, Conn.	11
<b>Coal, Miners of.</b>	Ely E. B. & Co., New York	11
	Pardee A. & Co., 111 Broadway, N. Y.	11
<b>Coal and Wood Vases.</b>	Esterbrook Wm., Philadelphia, Pa.	11
	Jewett John & Sons, Buffalo, N. Y.	11
	Griffiths Geo., Phila., Pa.	11
	New York Stampings, 111 Ave. A., N. Y.	11
<b>Cordage and Sash Mills.</b>	Lane Brothers, Millbrook, N. Y.	11
	Enterprise Mfg. Co., Philadelphia, Pa.	11
<b>Corks.</b>	Wister Francis, 230 S. Third, Phila., Pa.	11
<b>Compass and Dividers, Manufacturers of.</b>	Semle & Call Day & Tool Co., Springfield, Mass.	11
	Stevens J. & Co., Chicago Falls, Mass.	11
<b>Copper.</b>	Merchant & Co., 107 Market st., Phila.	11
	Pope, Cole & Co., Baltimore, Md.	11
	Pope Thos. J. & Co., 252 Pearl, N. Y.	11
	The New Haven Copper Co., 345 Pearl, N. Y.	11
<b>Cordage.</b>	Elizabethport Steam Cordage Co., 48 South, N. Y.	11
<b>Corners for Oil Cloths.</b>	Hubbell R., Northville, N. Y.	11
<b>Corn Huskers.</b>	Chambers, Berling & Quinlan, Decatur, Ill.	11
<b>Corn Poppers.</b>	Brown Mfg. Co., Cincinnati, O.	11
<b>Cornucopia Iron.</b>	Mosley Iron Bridge and Roof Co., 5 Dev. N. Y.	11
<b>Cotters and Cotton Reels.</b>	Browning, Slum & Co., 85 Chambers, N. Y.	11
<b>Crayons, Metal Workers.</b>	Stewart D. M., Cincinnati, Ohio	11
<b>Cupules.</b>	Seld R. B., Philadelphia, Pa.	11
	Taunton Crucible Co., Taunton, Mass.	11
<b>Cupules.</b>	Smith & Sayre Mfg. Co., 141 Broadway, N. Y.	11
<b>Cutlery, Importers of.</b>	Baker Hermann & Co., 101 Duane, N. Y.	11
	Bradford & Anthony, Boston, Mass.	11
	Catworthy F. W. & Co., Chambers, N. Y.	11
	Field Alfred & Co., 125 Chambers, N. Y.	11
	Friedman & Lauterjung, 11 Chambers, N. Y.	11
	Gifford Mfg. Co., Union City, Conn.	11
<b>Cuspadors.</b>	Eureka Lamp Co., Cleveland, O.	11
<b>Cutlery, Manufacturers of.</b>	Conway P. G. & Co., Chambers, N. Y.	11
	Furness, Bannister & Co., Newark, N. J.	11
	Greenfield Tool Co., Greenfield, Mass.	11
	John Russell Cutlery Co., 125 Chambers, N. Y.	11
	The Lamson & Goodnow Mfg. Co., 88 Chambers, N. Y.	11
<b>Dressed Iron.</b>	Philadelphia Smelting Co., Ltd., Philadelphia, Pa.	11
<b>Differential Pulley Blocks.</b>	Yale Lock Mfg. Co., 125 Chambers, N. Y.	11

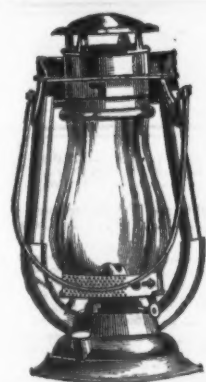
<b>Dog Collars.</b>	Modford Fane Goods Co., 96 Duane, N. Y.	11
<b>Discount Tables.</b>	Jennings S. H., Deep River, Conn.	11
	Leigh & E. B., Louisville, Ky.	11
	Pope & Stevens, 114 Chambers, N. Y.	11
<b>Dinner Pail and Lantern.</b>	Haight Joseph, Port Chester, N. Y.	11
<b>Door Bolts.</b>	Ives Hobart B., New Haven, Ct.	11
<b>Door and Gate Springs.</b>	Bartlett Frederick, Freeport, Ill.	11
	Butler Door Spring Co., Cleveland, O.	11
	Robuck S. & Co., 125 Fulton, N. Y.	11
	Van Wagoner & Williams, Newark, N. Y.	11
<b>Drilling Machines, Makers of.</b>	Sellers Wm. & Co., Phila., and 70 Liberty st., N. Y.	11
	Thorne, De Haven & Co., Philadelphia, Pa.	11
	Wiley & Russell Mfg. Co., Greenfield, Mass.	11
<b>Drive Trough Hangers.</b>	Hartley & Demsey, Toledo, Ohio	11
	Docher M. & Co., Chambers, N. Y.	11
<b>Electric Light.</b>	Fuller Electrical Co., 41 E. 14th, N. Y.	11
<b>Elevators, Makers of.</b>	Crane Bros. Mfg. Co., Chicago, Ill.	11
	Stokes & Parrish, Philadelphia, Pa.	11
<b>Elevator Buckets.</b>	Rowland T. F., Brooklyn, N. Y.	11
<b>Emery and Emery Wheels.</b>	Irving Townsend & Son, Chambers, N. Y.	11
	Leitch Valley Emery Wheel Co., Weisport, Pa.	11
	Rogers J. F. & Co., 125 Liberty, N. Y.	11
	Walpole Emery Mills, Boston, Mass.	11
<b>Engineers' Supplies.</b>	Bowers W. H. H., Salt Lake City, Utah	11
	Rogers J. F. & Co., 125 Liberty, N. Y.	11
<b>Engines, Gas.</b>	Schleicher, Schumm & Co., Philadelphia, Pa.	11
<b>Engines, Locomotive.</b>	Baldwin Locomotive Works, Philadelphia, Pa.	11
<b>Engines, Steam, Makers of.</b>	Cox & Sons, Philadelphia, Pa.	11
	Ervin Chas. W. & Co., Philadelphia, Pa.	11
	La France Fire Engine Co., Elmira, N. Y.	11
	Southward Foundry & Machine Co., Philadelphia, Pa.	11
	The Norwalk Iron Works Co., S. Norwalk, Conn.	11
	Twiss Nason W. & Co., Chester, Pa.	11
<b>Engines, Foundry.</b>	Emrick J. A. & Co., Philadelphia, Pa.	11
<b>Engines, Water.</b>	Bohren U. & Co., 207 W. 27th, N. Y.	11
	McNair & Harlin Mfg. Co., 125 Gold, N. Y.	11
	Enterprise Mfg. Co., of Pa., Phila., and N. Y.	11
	Lane Bros., Millbrook, N. Y.	11
	Sumner John, Son, Newark, N. J.	11
<b>Fencing, &amp;c.</b>	Cleveland Wrought Iron Fence Wks., Cleveland, O.	11
<b>Files, Manufacturers of.</b>	Field Alfred & Co., 125 Chambers, N. Y.	11
	Carr J. & Riley, 30 Gold, N. Y.	11
	Fraser & Co., 125 Chambers, N. Y.	11
<b>Files, Manufacturers of.</b>	Auburn File Works, 85 Chambers, N. Y.	11
	Barnett G. & H., 41 and 43 Richmond, Phila.	11
	Boydston, 125 Chambers, N. Y.	11
	Diston Henry & Sons, Phila.	11
	Everhart James M., Scranton, Pa.	11
	Johnson Co. Bros., 125 Chambers, N. Y.	11
	McCaffrey & Bro., 172 and 174 N. 4th, Phila.	11
	New American File Co., Pawtucket, R. I.	11
	Nicholson, 125 Chambers, N. Y.	11
	Paul Chas. B., Williamsburg, N. Y.	11
	Spencer John & Son, Sheffield, England	11
	The J. B. Smith & Co., Philadelphia, Pa.	11
	Union File Works, Baltimore, Md.	11
<b>Filters.</b>	Jewett John C. & Sons, Buffalo, N. Y.	11
<b>Fire Bricks, Manufacturers of.</b>	Borgner & O'Brien, Philadelphia, Pa.	11
	Colson Chas. D., Chicago, Ill.	11
	Garner Brothers, Pittsburgh, Pa.	11
	Hall & Sons, Buffalo, N. Y.	11
	Kreischer E. & Sons, Foot of E. Houston St.	11
	Lacle Fire Brick Works, Louisville, Mo.	11
	Maurer Henry, 415 East 2nd, N. Y.	11
	Miller S. F. & Co., Philadelphia, Pa.	11
	New York Fire Brick Co., New York	11
	Ostrander James & Son, Troy, N. Y.	11
	Rimington S. A., 256 Water, N. Y.	11
	Union Mining Co., Philadelphia, Pa.	11
	Valentine M. D. & Bro., Woodbridge, N. J.	11
	Watson Fire Brick Co., Perth Amboy, N. J.	11
<b>Flint and Emery Paper and Cloth.</b>	Reeder, Adams & Co., 75 Market, Phila.	11
<b>Forges, Portable, &amp;c.</b>	Buffalo Forge Co., Buffalo, N. Y.	11
	Cooke & Co., 125 Chambers, N. Y.	11
	Forge Company, Brooklyn, E. D., N. Y.	11
	Holt Mfg. Co., Cleveland, O.	11
	Hubbard Charles, 46 Cliff, N. Y.	11
	Howe Wm. & Co., West Philadelphia, Pa.	11
<b>Foundry Engines.</b>	Paxson J. W. & Co., 125 Beach, Phila.	11
	Porter John G., 125 Pearl, N. Y.	11
	Whitcomb Bros., 125 15th, N. Y.	11
<b>Forgings, Iron and Steel.</b>	Hubbard Charles, 46 Cliff, N. Y.	11
<b>Forgings, Makers of.</b>	Richmond & Potts, 119 S. 4th, Phila., Pa.	11
<b>Furnace Hoists.</b>	Stokes & Parrish, Phila., Pa.	11
	McDonald H., Pittsburgh, Pa.	11
<b>Furniture Springs.</b>	Cary & Moon, 234 W. 30th, N. Y.	11
<b>Garden Tools.</b>	Dunlap C. W. & Co., 41 Chambers, N. Y.	11
<b>Grates.</b>	Maynard J. Q., 97 Liberty, N. Y.	11
<b>Grate Bars.</b>	Creswell David S., Philadelphia, Pa.	11
<b>Grindstones.</b>	Atkinson E. & Co., Newcastle-on-Tyne, Eng.	11
	Atlantic Stone Co., Boston, Mass.	11
	Lombard & Co., Boston, Mass.	11
	Lea & B. Chas. & Co., Philadelphia, Pa.	11
	McDermott & Berra Stone Co., Philadelphia, Pa.	11
	Old Grindstone Co., Cleveland, O.	11
	Old Grindstone Co., Cleveland, O.	11
<b>Gunpowder, Makers of.</b>	Lafin & Hamd Powder Co., 20 Murray, N. Y.	11
<b>Hammers.</b>	Hartford Hammer Co., Hartford, Ct.	11
	Newlin & Yardley, Philadelphia, Pa.	11
<b>Handles, Spokes, &amp;c.</b>	Hundley & Hanks, 73 Reade, N. Y.	11
	Kidder Slide Door Hanger Co., Romeo, Mich.	11
	Roore S. H. & Co., Chicago, Ill.	11
<b>Hardware Connections, Manufacturers of.</b>	Broder & Leach, 112 Murray, N. Y.	11
	Field Alfred & Co., 125 Chambers, N. Y.	11
	Griffin & Co., 125 Chambers, N. Y.	11
	Heston & Denckla Hdw. Co., 507 Commerce, Phila.	11
	Hynes David & Co., 64 Church, N. Y.	11
<b>Hardware Dealers.</b>	Jennings C. E. & Co., 65 Chambers, N. Y.	11
	Lloyd, Supple & Walton, 65 Market, Phila.	11
	Smith & Co., 125 Chambers, N. Y.	11
<b>Hardware Importers.</b>	Baker Hermann & Co., 101 Duane, N. Y.	11
	Field Alfred & Co., 125 Chambers, N. Y.	11
	McKay & Sanders, 125 Duane, N. Y.	11
<b>Hardware Manufacturers.</b>	Farrington J. M. & Co., 37 Warren, N. Y.	11
	Flagler, Forsyth & Bradley, 25 Broadway, N. Y.	11
	Field Alfred & Co., 125 Chambers, N. Y.	11
	Lloyd, Supple & Walton, 65 Market St., Phila.	11
	Miller's Falls Co., 74 Chambers, N. Y.	11
	Smith & Co., 125 Chambers, N. Y.	11
	Shepard Hardware Co., Buffalo, N. Y.	11
	Stanley Works, New Britain, Conn.	11
	Trenton Lock & Hardware Co., Trenton, N. J.	11
	Union Mfg. Co., 125 Chambers, N. Y.	11
<b>Hardware Specialties.</b>	American Machine Co., 125 Chambers, N. Y.	11
	Cleveland Wrought Iron Fence Works, Cleveland, O.	11
	Davis Wm. L., Chelsea, Mass.	11
	Kyer & Rex, Philadelphia, Pa.	11
	Philly Mfg. Co., Philadelphia, Pa.	11
	Shepard Sidney & Co., Buffalo, N. Y.	11
	Seencer & Underhill, 64 Chambers, N. Y.	11
	Todd John J., 64 Chambers, N. Y.	11
	Wollensak J. F., Chicago, Ill.	11
<b>Harness Snaps.</b>	Globe Mfg. Co., West Troy, N. Y.	11
	Globe Mfg. Co., Middletown, Conn.	11
<b>Hay Rakes.</b>	Holt Hiram & Co., East Wiltton, Me.	11
<b>Heater and Purifier, Feed Water.</b>	Love & Watson, Bridgeport, Conn.	11
<b>Heel Stiffeners.</b>	Kimball Shoe Co., Baltimore, Md.	11
<b>Hinges.</b>	Loyd, Copper and Brass Rolling Mills, Detroit, Mich.	11
	Dickerson, Van Dusen & Co., 30 and 31 Cliff, N. Y.	11
	Goldman & Co., 125 Chambers, N. Y.	11
	Merchant & Co., Philadelphia, Pa.	11
	Naylor & Co., 99 John, N. Y.	11
	Paulsen Wm. P. O. Box 357, New York	11
	Phelps, Dodge & Co., 125 West John & Fulton, N. Y.	11
	Philly Mfg. Co., Philadelphia, Pa.	11
	Purves A. & Son, 125 South and Penn, Phila.	11
	Quincy J. W. & Co., 125 Wm. N. Y.	11
	Sead D. W. B. & Co., 204 Walnut, Phila.	11
	Schoenberger Metal Mfg. Co., 125 E. 20th, N. Y.	11
	Starr John, Halifax, Nova Scotia	11
<b>Metallurgists.</b>	Booth, Garrett & Blair, 219 Chant, Philadelphia, Pa.	11
	Britton I. Blodgett, 329 Walnut, Philadelphia, Pa.	11
	North Carolina Iron Works, Westminister, Md.	11
	Sawyer Ezra, Worcester, Mass.	11
<b>Mills, Portable.</b>	North Carolina Iron Works, Westminister, Md.	11
<b>Mining Knives.</b>	Leonard Bro., Scranton, Pa.	11
<b>Miner's Candles, Makers of.</b>	James Boyd & Sons, 10 and 12 Franklin, N. Y.	11
	E. Stebbins Mfg. Co., Brightwood P. O., Springfield, Mass.	11

<b>Chicago Steel Shoe Makers of</b> Chicago Steel Horse Shoe Co., Chicago, Ill.	1
<b>Combination Iron Clad Steel Horse Shoe Co., Bos-</b> ton, Mass.	1
<b>Keystone Horse Shoe Co., Philadelphia, Pa.</b>	1
<b>Rhode Island Horse Shoe Co., Providence, R. I.</b>	1
<b>Schmidt &amp; Clark, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000</b>	1
<b>The Burden Iron Co., Troy, N. Y.</b>	1
<b>Hot Blast Stoves</b> Witherow & Gordon, Pittsburgh, Pa.	3
<b>Hydrants, &amp;c.</b> McClellan & Co., 100 Monroe, N. Y.	3
Mohawk & Hudson Mfg. Co., Watertown, N. Y.	3
<b>Hydraulic Jacks.</b> Borden & Bluff, 112 Columbia, N. Y.	3
Lyons & Co., 108 Grand, N. Y.	3
<b>Ice Cream Freezers.</b> Roeback & Co., 164 Fulton, N. Y.	3
W. W. Mainland Freezer Co., Lacoma, N. H.	3
<b>Injectors.</b> Jenks James, Detroit, Mich.	3
<b>Insurance, Boiler.</b> Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.	3
<b>Iron.</b> The Travelers' Life and Accident Insurance Co., Hartford, Conn.	3
<b>Iron. (Manufacturers' Agents.)</b> C. J. Smith & Co., 208 3d, Phila.	3
Hoffman J. W. & Co., 208 3d, Phila.	3
Levy Henry & Co., Philadelphia, Pa.	3
Scott & Clark, 60, 62, 64, 66, 68, Boston, Mass.	3
<b>Iron. Manufacturers of.</b> Albany & Rensselaer Iron & Steel Co., Troy, N. Y.	3
Albany Rolling Mill Co., Albany, Pa.	3
Britton Iron and Steel Co., Cleveland, Ohio.	3
Burden Iron Company, Troy, N. Y.	3
Port Land & Cement Co., Erie, Pa.	3
Elba Iron and Bolt Co., Limited, Pittsburgh, Pa.	3
Kirkpatrick & Co., Pittsburgh, Pa.	3
North Chicago Rolling Mill Co., Chicago, Ill.	3
Phoenix Iron Co., 410 Walnut, Philadelphia	3
Roane Iron Co., Chattanooga, Tenn.	3
Rome Merchant Iron Mills, Rome, N. Y.	3
Rowland Wm. & Harvey, Philadelphia	3
Shoenberger & Co., Pittsburgh, Pa.	3
Union Iron Works, 60 Broadway, N. Y.	3
Williams, Long & McDowell, Pittsburgh, Pa.	3
Zug & Co., Pittsburgh, Pa.	3
<b>Iron Brokers.</b> Boynton Geo. A., 75 Wall, N. Y.	3
Edging & Ward J., Philadelphia, Pa.	3
Fox & Drummond, 68 Wall, N. Y.	3
Gallaudet F. W. & Co., Broadway and Wall, N. Y.	3
Gray & Thayer, 68 Wall, N. Y.	3
Lundell Chas. G. (Swedish), Boston, Mass.	3
Quincy John W. & Co., 38 William, N. Y.	3
<b>Iron. (Landscape.)</b> Bailey J. F. & Co., 57 Wall, N. Y.	3
Field Alfred & Co., 93 Chambers, N. Y.	3
W. H. Horton Co., 100 Chambers, N. Y.	3
Hershenfeld L., 105 John, N. Y.	3
Lundell Chas. G., Boston, Mass.	3
Morgan J. F., 105 John, N. Y.	3
Richardson J. O., 232 Dock, Philadelphia	3
Wister L. R., 20 South Fourth, Philadelphia	3
<b>Iron Dealers.</b> Abel Brothers, 100 South, N. Y.	3
Adams Hugh W. & Co., 55 Pine, N. Y.	3
Bonelli, Bortoford & Co., Yonkers, N. Y.	3
Brown & Co., 100 South, N. Y.	3
Carmichael & Emmens, 102 and 104 Cedar, N. Y.	3
Cooney Daniel F., 88 Washington, N. Y.	3
Edging & Ward J., 105 John, N. Y.	3
Earnshaw Alfred, Philadelphia, Pa.	3
Edgerton Bros. & Co., 160 South, N. Y.	3
Edging & Ward J., 105 John, N. Y.	3
Hoffman J. W. & Co., 208 3d, Fourth, Philadelphia	3
Judson R. F., 47 and 49 Water, N. Y.	3
Kaufman & Hirsch, 58 and 60 Water, N. Y.	3
Lasberger S. A., 530 E. 10th, N. Y.	3
Lundberg Gustaf, 83 Kilby, Boston, Mass.	3
Lyons & Co., 108 Grand, N. Y.	3
Middleton W. S., 3 John, N. Y.	3
Naylor & Co., 90 John, N. Y.	3
Quincy John W. & Co., 38 William, N. Y.	3
Pierson & Co., 24 Broadway, N. Y.	3
Pullman J. Wesley, Philadelphia, Pa.	3
Quincy John W. & Co., 38 William, N. Y.	3
Reynolds, Carter & Reynolds, London, England	3
Richards D. W. & Co., 60 Manring, N. Y.	3
Roberts J. F., 105 John, N. Y.	3
Wallace Wm. H. & Co., Albany and Washington streets, N. Y.	3
Whitney A. B., 85 Hudson, N. Y.	3
<b>Iron, Pipe, Importers of.</b> Clark & Co., 100 Wall, N. Y.	3
Clark E. W. & Co., Philadelphia, Pa.	3
Lee James & Co., 75 Pine, N. Y.	3
Lyons & Co., 108 Grand, N. Y.	3
Williamson James & Co., 38 Wall, N. Y.	3
<b>Iron, Sheet, Manufacturers of.</b> Hopkins & Ferry, 107 W. 11th st., N. Y.	3
Lefferts & Co., 100 South, N. Y.	3
Marshall Iron Co., Newport, Del.	3
Wood W. D. & Co., Pittsburgh, Pa.	3
Wood & Smith, 100 South, N. Y.	3
Howard & Morse, 45 Fulton, N. Y.	3
<b>Jacks.</b> Hill & Co. A. & Co., East Newark, N. J.	3
<b>Jack Screws.</b> Beger Mfg. Co., Springfield, Mass.	3
<b>Lanterns.</b> Taylor & Boggs, Cleveland, O.	3
<b>Lanterns, Manufacturers of.</b> Bates R. E. & Co., 100 South, N. Y.	3
Howard & Morse, 45 Fulton, N. Y.	3
Miller Edw. A. & Co., 35 Warren, N. Y.	3
<b>Lawn Mowers.</b> J. C. Smith & Co., 100 South, N. Y.	3
<b>Lead, Pipe.</b> U. S. Smelting Works, Philadelphia, Pa.	3
<b>Lead, Pipe.</b> Dixson Henry & Sons, Philadelphia.	3
Jennings C. E., 65 Chambers, N. Y.	3
<b>Leather Goods, Manufacturers of.</b> Sobhan Wilson, Brooklyn and 40 South, Brook-	3
lyn, E. D.	3
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Hillbrand & Wolf, 110 W. 8th, Philadelphia	3
Smith & Egg, 100 South, N. Y.	3
Yale Lock Mfg. Co., 53 Chambers, N. Y.	3
<b>Machinery.</b> J. C. John New Haven, Conn.	3
Giles & Williams, 109 Plymouth, Brooklyn	3
Borliff & Co., 45 Green, Phila.	3
Lefferts & Co., 100 South, N. Y.	3
Forsyth S. C. & Co., Manchester, N. H.	3
Pratt & Co., 65 Chambers, N. Y.	3
L. B. Flanders Machine Works, Philadelphia, Pa.	3
Monawick & Hudson Mfg. Co., Watertown, N. Y.	3
Pittsburgh Mfg. Co., Pittsburgh, Pa.	3
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Pratt I. H., Cleveland, O.	3
Quincy John W. & Co., 38 William, N. Y.	3
Rogers J. F. & Co., 107 Liberty, N. Y.	3
S. A. Woods Machine Co., 91 Liberty, N. Y.	3
Stokes & Parrish, Phila. and 173 Liberty st., N. Y.	3
The Siles & Parker Press Co., Midway, Ut.	3
York & Smith, Cleveland, O.	3
<b>Machinery (Harnes's) (Hot Power).</b> Little Chas. E., 65 Fulton, N. Y.	3
<b>Machinery (Harnes's) (Cold Power).</b> Fellows John & Sons, Watertown, N. Y.	3
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Quincy John W. & Co., 38 William, N. Y.	3
Flanders L. B., 1035 Hamilton, Philadelphia, Pa.	3
Fraser & Co., 65 Chambers, N. Y.	3
Harrington E. & Son, 15th st. and Pennsylvania av., Philadelphia, Pa.	3
J. C. John New Haven, Conn.	3
King J. M. & Co., Watertown, N. Y.	3
Rogers J. F. & Co., 107 Liberty, N. Y.	3
Stokes & Parrish, Phila. and 173 Liberty st., N. Y.	3
Wickersham & Co., Philadelphia, Pa.	3
<b>Mallets.</b> J. C. John New Haven, Conn.	3
Penfield Block Co., Lockport, N. Y.	3
<b>Measuring Tapes.</b> Edy Geo. M. & Co., 333 Nassau av., Brooklyn, N. Y.	3
<b>Metall. Choppers.</b> National Shoe Co., Baltimore, Md.	3
<b>Metalists.</b> Detroit Copper and Brass Rolling Mills, Detroit, Mich.	3
Goldsmith Moses & Son, Charleston, S. C.	3
Merchant & Co., Philadelphia.	3
Northrop A. C., Watertown, Conn.	3
Paulsen Wm., P. O. Box 308, New York	3
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia, Pa.	3
Quincy John W. & Co., 38 William, N. Y.	3
Sead D. W. R. & Co., 205 4th, Phila.	3
Star John's. Halifax, Nova Scotia.	3
<b>Metalurgists.</b> Blair & Blair, 935 Chant, Philadelphia.	3
<b>Metalists.</b> Stodgett, 330 Walnut, Philadelphia.	3
<b>Metal Separator.</b> Forester, Mass.	3
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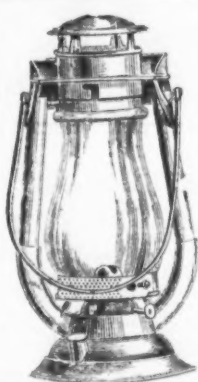


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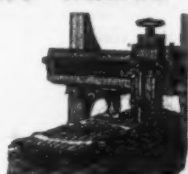
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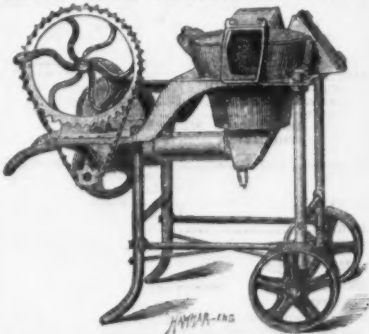
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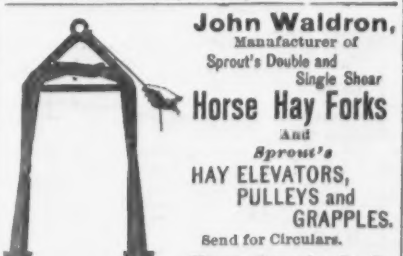
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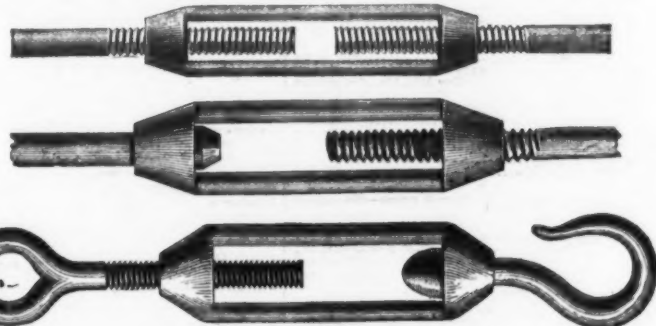


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Of Every Description,  
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FOR 1/4 INCH HEEL.

### To Ad Whom it May Concern:

To-day a decree in my suit against G. T. Fisher & Co., of Detroit, for an infringement of my patent, was made and entered, of which the following is an extract:  
At a session of the Circuit Court of the United States for the Eastern District of Michigan, held at Detroit, &c., on Wednesday, the 8th day of December, 1880.

NELSON LYON  
against  
GUYON T. FISHER, et al.  
It is ordered, adjudged and decreed, that the act entitled "An act for the relief of Nelson Lyon and Jeremiah S. James," passed by Congress and approved April 1, 1880, &c., is a good, valid and constitutional act.  
That the original patent, bearing date July 9, 1872, and numbered 123,456, granted and issued to Joseph Baraloux, Jeremiah S. James and Nelson Lyon, which corrected by the Acting Commissioner of Patents, as directed by said act, was a good and valid patent.  
That the said Joseph Baraloux was the original and first inventor of the improvements in metallic stiffeners for boot and shoe heels mentioned and described in said letters patent.  
That the said Nelson Lyon is the assignee of said Joseph Baraloux, and is entitled to the benefit of said patent.  
That the said Guyon T. Fisher & Co. have infringed upon the said patent, and are liable to the said Nelson Lyon for the damages caused by such infringement.  
That the said Guyon T. Fisher & Co. have also infringed upon the said patent, and are liable to the said Nelson Lyon for the damages caused by such infringement.  
That the said Nelson Lyon is entitled to the exclusive rights of said patent, and to the profits and damages caused by such infringement.  
That the said Guyon T. Fisher & Co. are liable to the said Nelson Lyon for the costs and disbursements in the action.  
It is also further ordered, adjudged and decreed, that a perpetual injunction be issued against said defendants, according to the prayer of the said complainant's bill.  
You are also hereby notified that the perpetual injunction has been issued and served on the defendants.

All questions as to damages and settlements in relation to infringements under my patents must be addressed to and made with my attorney, WILLIAM H. KING, in my care at the above address.

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## New York Wholesale Prices, September 7, 1881.

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[illegible]



[illegible]

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Warranted Superior to any Steel in the Market, either  
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Also,  
Combination Chrome Steel and Iron for  
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## Steel Rails,

ALL WEIGHTS.

The Company Warrant its Rails equal in quality to any manufactured in the  
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Special Steel  
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Turns out at least double work by increased speed  
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For Rollers, Fire-bricks, &c.  
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For Railroad purposes.

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**ENGINEERS.**  
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THE PATENT  
SCREW WINDOW BALANCE

With which the Sashes work as  
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being at an expense of one-half  
the cost of applied weights, no  
boxings being required. The  
Sashes are Locked with the meet-  
ing rail lock. Stands alone in its  
working. Price \$1 per set (four.)  
Discount to the trade. In use over  
three years. Robt. B. Huganin,  
Sole Maker, Hartford, Ct., U. S. A.

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## Solid Cast-Steel Hammers

HARTFORD, CONN., U. S. A.  
For sale by C. E. JENNINGS & CO., 96  
Chambers St., New York, and the trade  
generally.

**FORGED OX SHOES.**  
The only Ox Shoe made with  
patent convexity to fit hoof.  
Also Flat Shoes with two calks  
complete, at same price.  
Worth double any shodden  
Iron Shoe.

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## STRUCTURAL IRON.

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees,  
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Special attention given Unusual Shapes and Sizes.

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ESTABLISHED 1847.

CAPITAL, \$3,000,000.

INCORPORATED 1869.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

MERCHANT BAR, FISH PLATES, PIG METAL,  
IRON RAILS & BESSEMER STEEL RAILS.

Present Annual Capacity of these Works.	Fish Plates.....13,000 tons
	Merchant Bar.....40,000 "
	Pig Metal.....120,000 "
	Iron Rails.....100,000 "
	Steel Rails.....100,000 "
	Total Capacity per year.....473,000 "

## OFFICES

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## THE SIEMENS-ANDERSON STEEL CO.,

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Manufacturers ofCrucible Tool, Cast Spring, Cast Plow, Iron Centre,  
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Spring, Tire, Plow, Machinery, and

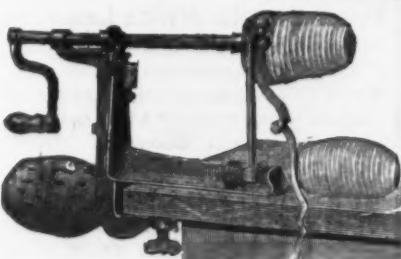
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Patent Applied For.



The White Mountain Potato Parer is the only machine ever made that will not only pare a potato much better than it can be done by hand, taking off a thinner paring from every shape or kind of potato, but will go into and clean out the eyes, and altogether at a saving of at least 20 per cent. It is free from the objections made to the old style of rattletrap, geared parers; is solid and substantial, cannot get out of order, and so cheap as to be within the means of everybody.

Almost any of the Potato Parers in the market seem as if they might do the work better "next time," but the "White Mountain" DOES IT NOW. Every Machine warranted as represented.

Price to the Trade, \$8 per dozen.

GOODSELL CO., Antrim, N. H., Sole Manuf'rs.

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## MERCHANT BAR IRON,

Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge,  
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Bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our  
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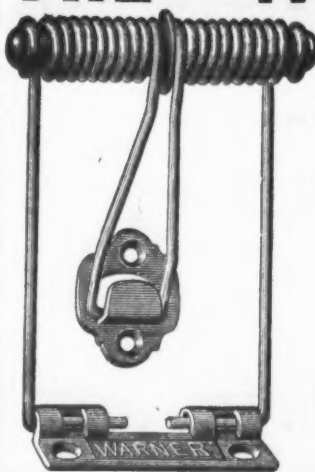
## PIC IRON AND NAILS,

Manufacture the Celebrated Brand of

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are the most simple, most effective and most convenient ever introduced, and the immense sale we  
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uniform pressure, holding the door tight when closed, and allowing it to open without increasing  
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When the door is opened about 130 degrees of a circle, it will press and hold it open.

The Spring is easily unhooked and rehooked—in an instant—from the door and also  
from the jamb, without removing a screw or pin.

This is a Convenience Possessed by no other Spring in the Market.

We are making this season three sizes, viz:

No. 1 For Screen or Light Storm Doors.

No. 2 For Medium Doors.

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They are for sale by most of the prominent jobbers of the United States and Canada.

Correspondence solicited.

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ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

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week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British  
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It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to  
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of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach  
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so far as experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertise-  
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other ordinary channels of communication.



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FIRE BRICK.**

BEST AND CHEAPEST.  
Established 1845.  
Office, foot of Houston Street, East River,  
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ALBANY, N. Y., Manufacturers of

**FIRE BRICK**

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

For Glass and Steel Works.

**SILICA,**

Bricks and Cement,

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Newcastle-on-Tyne.

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**FIRE BRICK**

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

**FIRE BRICK**

Edge Pressed Furnace Blocks,

CLAY RETORTS, TILES, &c.,

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Above Race,

Twenty years' practical experience.

WATSON FIRE BRICK CO.,

ESTABLISHED 1836.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturers of

**FIRE BRICK,**

OR ROLLING MILLS, BLAST FURNACES, FOUN-

DRIES GAS WORKS, LIME KILNS, TANNERIES,

BOILER and GRATE SETTING, GLASS WORKS, &c.

Fire Clay, Fire Sand, and Kaolin for Sale.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,

Manufacturer of FIRE BRICK, HOLLOW

BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY.

See & Depot: 418 to 422 East 33d St., N. Y.

TROY FIRE BRICK WORKS,

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JAMES OSTRANDER & SON,

ESTABLISHED 1848.

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Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and

Dealers: 2 Woodbridge Fire Clay and Sand, and Staten

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Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK,

TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and

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WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

Buffalo, N. Y.

CHAS. D. COLSON,

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Foundry Facings, Sand, Tools and Supplies.

CHICAGO, ILL.

UNION MINING COMPANY.

Mount Savage Fire Brick.

EDWARD J. ETTING, Agent,

No. 230 South Third St., Philadelphia, Pa.

MILLER'S BRICK PRESSES

(Established 1844).

FIRE AND RED BRICK,

And Brickmakers' Tools in General.

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**HENRY DISSTON & SONS,**

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets,

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**DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.**

Fig. 1.

Patented May 29, 1870.

Price, - - - \$37.50 per dozen.

Fig. 2.



No Farmer, Nurseryman, Railroad  
or Telegraph Company  
**SHOULD BE WITHOUT ONE.**

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

**DIRECTIONS.**

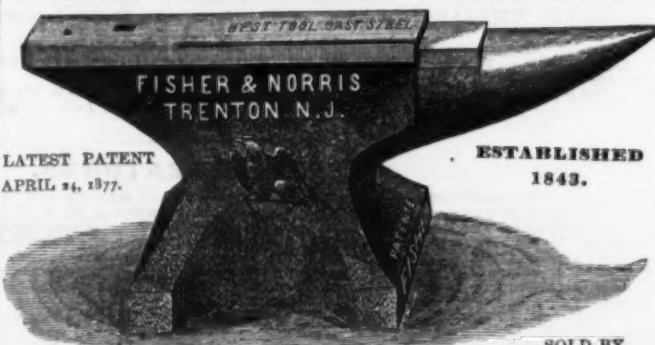
Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

**HENRY DISSTON & SONS.****THE "EAGLE" ANVIL.****WARRANTED!!**

Better than the Best English Anvil.

Face in one piece, of BEST TOOL CAST STEEL. PERFECTLY WELDED, perfectly true; of hardest temper and never to come off or "settle." It does not bounce the hammer back, and therefore can do more work with lighter hammer. Horn of tough untempered steel, never to break or bend. Only Anvil made in United States fully warranted as above. None genuine without our trade-mark.

N. B.—That the "Eagle" Anvil is the only one made at Trenton, New Jersey, and it must not be mistaken for an Anvil in the market called Trenton, but which is really of foreign manufacture, and an imported imitation of the English Anvil.



LATEST PATENT  
APRIL 24, 1877.

ESTABLISHED  
1843.

SOLD BY

New York—RUSSELL & ERWIN MANUFACTURING COMPANY, DURRIE & McCARTY, TENNIS & WILSON.

Philadelphia—JAMES C. HAND & CO. Boston—GEORGE H. GRAY & DANFORTH.

Baltimore—W. H. COLE & SONS, JOHN E. KELSO, JR. Cincinnati—POST & CO.

Louisville—W. B. BELKNAP & CO. Cleveland—THE LAKE ERIE IRON CO.

**Escutcheon Pins, Small Rivets and Screws,**

And Specialties in this line made to order by

**BLAKE & JOHNSON,**  
WATERBURY, CONN.

**BOLSTER SPRINGS FOR FARM WAGONS.**

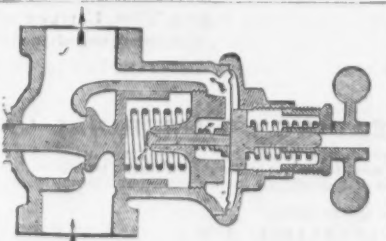
Made of Best Oil Tempered Steel.

The ONLY RELIABLE Bolster Spring in Use.



**SIMPLE AND SATISFACTORY.**  
They save largely from wear and tear in every part of the Wagon. They remove all necessity for a Spring Seat. They convert a common Lumber Wagon into a Spring Wagon, making it equally comfortable for from one to twenty persons. They are admirably adapted to the waste of Fruit and Vegetable Growers. They are suited to all makes and sizes of Farm Wagons, and can be attached by any one. They make the cheapest and easiest riding Spring Wagon in the market. These Springs have been in practical use for over four years, and are a pronounced success. No Teamster or Farmer can afford to be without them. We want Agents everywhere. Send for description and price, and mention this paper.

SEMPLE & BIRGE MFG. CO., ST. LOUIS, MO.

**Curtis Pressure Regulator.**

In made entirely of metal; occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by

CURTIS REGULATOR CO.,

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HOWARD IRON WORKS,

BUFFALO, N. Y.,

Manufacturers of

**BOLT CUTTERS**

AND NUT TAPPING MACHINES,

(Schlenker's Patent.)

Send for Illustrated Catalogue.

**ROCKING BLOCK GRATE,**

Williams' Patent,

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Fire level. Accumulation of cinders impossible. No cleaning out of fires during the day. Parts easily and cheaply replaced. Seventy per cent. of air space. Thirty days' trial. Send for circular.

**GREEN'S PURE SILICA FIRE BRICK,**

MADE BY

LACLEDE FIRE BRICK MANUFACTURING CO.,

SPECIALY ADAPTED FOR

Pernot and Siemens Open Hearth

Steel Furnaces and for Glass Furnaces.

Office, 901 Pine St., St. Louis, Mo.

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Please notice that we have removed from No. 295 THIRD AVENUE to

No. 37 Warren Street, near Church St.,

Where we hope to be favored with a continuance of your generous patronage.

J. M. FARRINGTON & CO.,

Successors to DAY, FARRINGTON & CO., Manufacturers of

LOCKS, KNOBS, GONGS, BLANK KEYS,

Wrought Store Door and Flush Bolts, Silver Plated, Ornamental Bronze and other Hardware.

**DAVID HYMES & CO.,**

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**JOB LOTS OF HARDWARE & CUTLERY.**

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No. 231 South Front St.,  
PHILADELPHIA.



TRADE MARK.  
MANUFACTURERS OF  
Pure White Lead, Red Lead, Litharge,  
Orange Mineral, Linseed Oil,  
AND PAINTERS' COLORS.

**Brooklyn White Lead Co.**

TRADE MARK  
White Lead, Red Lead & Litharge.  
No. 182 Front Street,  
NEW YORK.

JOHN JEWETT & SONS,  
Manufacturers of the well-known brand of  
**WHITE LEAD.**



TRADE MARK  
ALSO MANUFACTURERS OF  
**LINSEED OIL.**  
182 Front Street, NEW YORK.

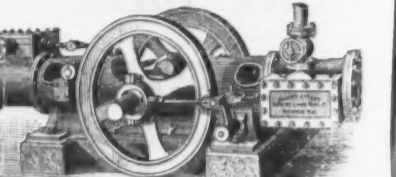


The Atlantic White Lead and  
Linseed Oil Co.,

Manufacturers of  
White Lead (Atlantic), Red Lead, Lith-  
arge, Glass Makers' Litharge and  
Orange Mineral;

**LINSEED OIL,**  
Raw, Refined and Boiled.

**ROBERT COLGATE & CO.,**  
287 Pearl St., NEW YORK.

**AIR COMPRESSORS.**

ALLEN'S  
HIGH SPEED AIR COMPRESSORS,

With Positive Moving Valves,  
Allen Engines, Stationary and Marine Boilers,  
Hoisting Machinery. Also, Patent Evaporators  
and Condensers for Animal Matters.

**AIR COMPRESSORS A SPECIALTY.**  
**JOHN McLAREN,**  
River Street, - - - HOBOKEN, N. J.

WILLIAM H. ALBRY,  
Chairman. PETER D. WALKER,  
Sec. and Treas.

**Mellert Foundry & Machine Co.,**  
Limited,  
(Works Established at Reading, Pa., in 1843.)  
Manufacturers of

Specials, Flange Pipe, Retorts, Valves and Hydrants,  
Lamp Posts, &c. The Improved Canadian Tur-  
bine Water Wheel, Machinery and Castings  
for Furnaces, Rolling Mills, Grists and Saw Mills, Min-  
ing Pumps, Bolts, &c. Columns, Brackets, Iron  
Railings, &c.

AND ALL KINDS OF CASTINGS.  
Sole Agents, Reading, Pa.



PHILADELPHIA.

Corrected Weekly by Lloyd, Supplee & Walton.

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

**Apples.**  
Peter Wrights, 100 lbs. \$1.00  
Over 200 lbs. 110  
Eagle (American) 100 lbs. \$1.00

**Apple Pares.**  
Penn Apple Pares, 100 lbs. \$1.00  
Rotary Peach Pares, 100 lbs. \$1.00  
Lots of 10 to 25 dozen special prices.

**Axes.**  
Hunt's Kentucky and Yankee, per doz \$9.50 (100 lbs)  
Hunt's Red Warrior, 100 lbs. \$9.50  
Richard Chief, 100 lbs. \$9.50  
Beveled Axes, 100 lbs. \$9.50  
Double Bit Axes, 100 lbs. \$9.50

**Augers and Auger Bits.**—New List January 1.  
Bates' Nut Augers, 100 lbs. \$1.00  
Cook's Augers, 100 lbs. \$1.00  
Watrous Ship Augers, 100 lbs. \$1.00  
Benjamin Pierce Auger Bits, 100 lbs. \$1.00  
Orinwald Auger Bits, 100 lbs. \$1.00  
Cook's Augers, 100 lbs. \$1.00  
Jonnings', 100 lbs. \$1.00  
Bonney's Pat. Hol. Augers, list \$8.50 doz. \$1.00  
Stearns' Pat. Hol. Augers, list \$8.50 doz. \$1.00

**Balances.**  
Light and Common, 100 lbs. \$1.00

**Bells.**  
Beyn Bros. Mfg. Co. Light Hand Bells, 100 lbs. \$1.00  
Swiss Pattern Hand Bells, 100 lbs. \$1.00  
Connell's Door Bell, 100 lbs. \$1.00  
St. Western & Kentucky, 100 lbs. \$1.00

**Belt and Rivet Clippers.**  
Chambers' No. 1, for 1/2 inch, each, \$7.00  
No. 2, 1/2 inch, each, \$7.00  
No. 3, 3/4 inch, each, \$7.00

**Boring Machines.**  
Upright, without Augers, 100 lbs. \$1.00  
Angular, without Augers, 100 lbs. \$1.00

**Bolts.**—Eastern Carriage Bolts, 100 lbs. \$1.00  
Philadelphia, 100 lbs. \$1.00  
Stanley, Wrought Shutter, 100 lbs. \$1.00

**Braces.**—Barber's, 100 lbs. \$1.00  
Backus, 100 lbs. \$1.00  
Boothford, 100 lbs. \$1.00  
American Ball, 100 lbs. \$1.00

**Butts.**—Cast Fast Joint, Narrow, 100 lbs. \$1.00  
Cast Loose Joint, Broad, 100 lbs. \$1.00  
Acorn, Loose Pin, 100 lbs. \$1.00  
Mayer's Loose Joint, 100 lbs. \$1.00  
Wrought Loose Pin, 100 lbs. \$1.00  
Table Hinges and Back Flaps, 100 lbs. \$1.00  
Narrow, Flat, 100 lbs. \$1.00  
Loose Joint, 100 lbs. \$1.00

**Blind Butts.**  
Parker, 100 lbs. \$1.00  
Clark, 100 lbs. \$1.00  
Shepard, 100 lbs. \$1.00  
Lull & Porter, 100 lbs. \$1.00  
Huffer's, 100 lbs. \$1.00

**Chains.**—German Hatter and Coll. new list Oct. 22, 1880, 100 lbs. \$1.00  
Galvanized Pump, 100 lbs. \$1.00  
Best Proof Coil Chain—English, 100 lbs. \$1.00  
W. B. 12 1/2 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

**Chisels.**—Socket Framing, 100 lbs. \$1.00  
Socket Firmer, 100 lbs. \$1.00  
Butcher's, 100 lbs. \$1.00

**Casters.**—Bed (new list July 1, 1880), 100 lbs. \$1.00  
Plate, 100 lbs. \$1.00

**Coffee Mills.**—New and Side, new list Jan. 1, 1881, 100 lbs. \$1.00  
Enterprise, 100 lbs. \$1.00

**Cutlery.**—Walden Pocket, 100 lbs. \$1.00  
Lenders, Fray & Clark, 100 lbs. \$1.00  
Goodnow Mfg. Co. and Meriden Cutlery Co. Manufacturers' prices net.

**Drawing Knives.**  
Hart Mfg. Co., 100 lbs. \$1.00  
Adjustable Handle, 100 lbs. \$1.00

**Fry Pans.**  
Tinned, 100 lbs. \$1.00  
No. 1, 100 lbs. \$1.00  
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No. 100, 100 lbs. \$1.00

**Files.**  
Nicholson, 100 lbs. \$1.00  
Dixton, 100 lbs. \$1.00  
Butcher, 100 lbs. \$1.00  
Browner, 100 lbs. \$1.00  
E. M. Boynton, new list, 100 lbs. \$1.00

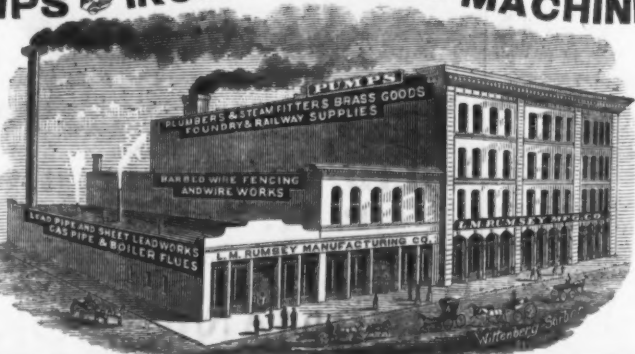
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**Files.**  
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—73 1/2 in. roll, 100 lbs. \$1.00  
—74 in. roll, 100 lbs. \$1.00  
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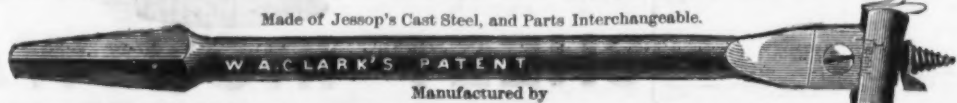
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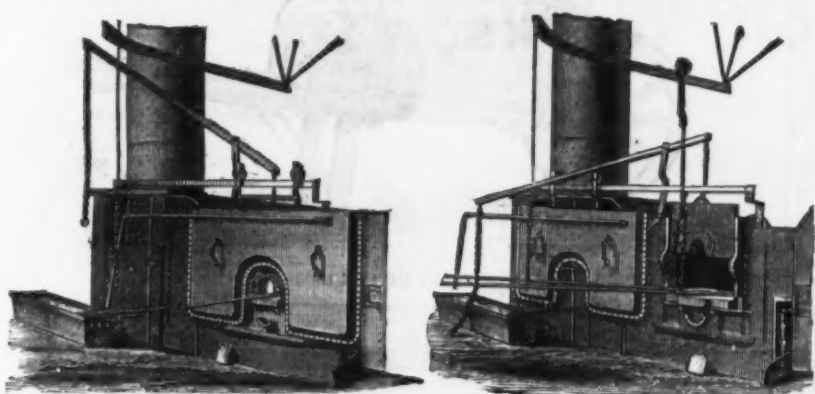
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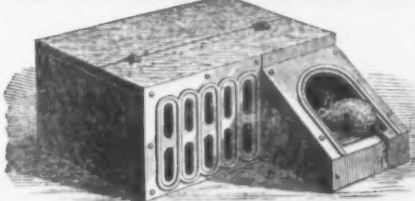
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four different sized currents of  
air may be passed, thereby mak-  
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18 inches in diameter; for  
instance, if a  
large fire is be-  
ing used and the next job  
should be a  
small rod, we do  
not move or  
burn the large  
bed of coal,



but turn the small tube up and so concen-  
trate the heat to the point desired.  
The constant flow of water keeps the  
Tuyere cool and prevents cinders or clinkers  
from forming in the fire. To prevent the  
water from freezing in the pipes, the barrel  
is supplied with a faucet that empties the  
pipes but not the barrel. All the dirt from  
the fire sifts through the perforated fire cap  
into the dirt box, from which it is blown by  
the blast when the ball valve is raised for  
that purpose. I also furnish Tuyere Irons  
without water attachment. See first issue  
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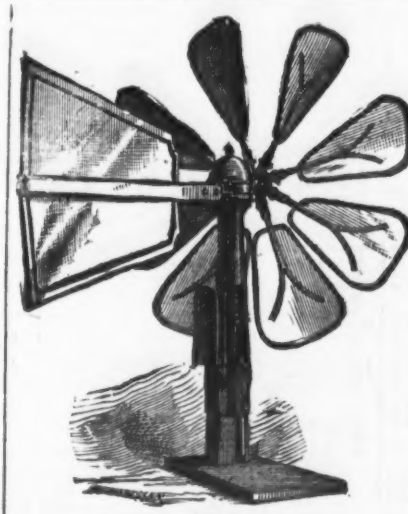
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Iron" three months, I pronounce it perfect in every  
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No. 448, \$ 2260 00; No. 449, \$ 2265 00; No. 450, \$ 2270 00; No. 451, \$ 2275 00; No. 452, \$ 2280 00; No. 453, \$ 2285 00; No. 454, \$ 2290 00; No. 455, \$ 2295 00; No. 456, \$ 2300 00; No. 457, \$ 2305 00; No. 458, \$ 2310 00; No. 459, \$ 2315 00; No. 460, \$ 2320 00; No. 461, \$ 2325 00; No. 462, \$ 2330 00; No. 463, \$ 2335 00; No. 464, \$ 2340 00; No. 465, \$ 2345 00; No. 466, \$ 2350 00; No. 467, \$ 2355 00; No. 468, \$ 2360 00; No. 469, \$ 2365 00; No. 470, \$ 2370 00; No. 471, \$ 2375 00; No. 472, \$ 2380 00; No. 473, \$ 2385 00; No. 474, \$ 2390 00; No. 475, \$ 2395 00; No. 476, \$ 2400 00; No. 477, \$ 2405 00; No. 478, \$ 2410 00; No. 479, \$ 2415 00; No. 480, \$ 2420 00; No. 481, \$ 2425 00; No. 482, \$ 2430 00; No. 483, \$ 2435 00; No. 484, \$ 2440 00; No. 485, \$ 2445 00; No. 486, \$ 2450 00; No. 487, \$ 2455 00; No. 488, \$ 2460 00; No. 489, \$ 2465 00; No. 490, \$ 2470 00; No. 491, \$ 2475 00; No. 492, \$ 2480 00; No. 493, \$ 2485 00; No. 494, \$ 2490 00; No. 495, \$ 2495 00; 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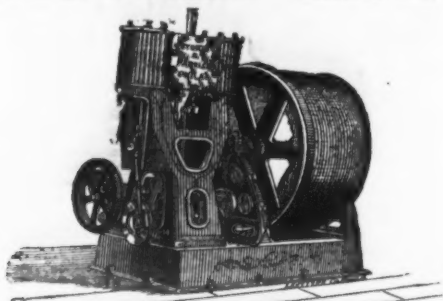
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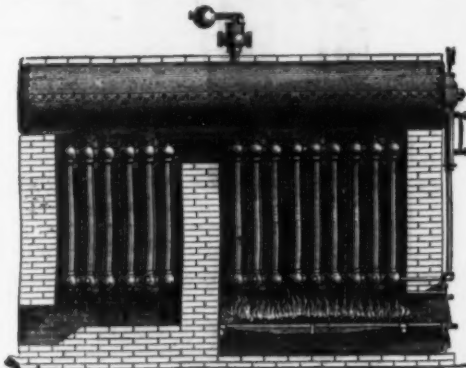
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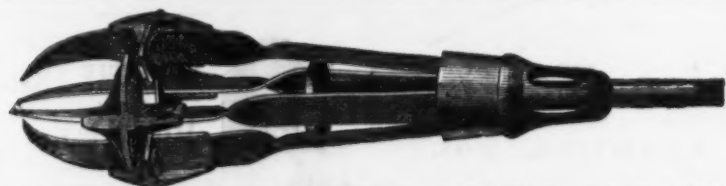


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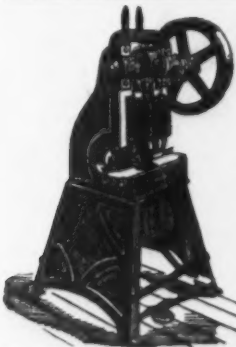
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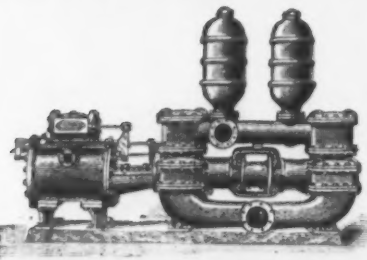
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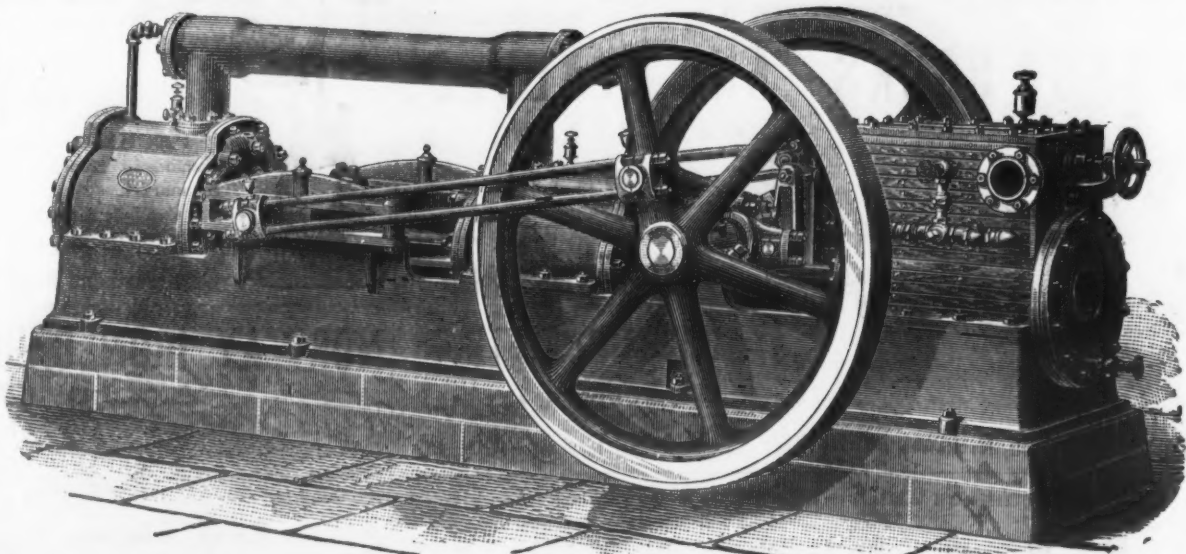
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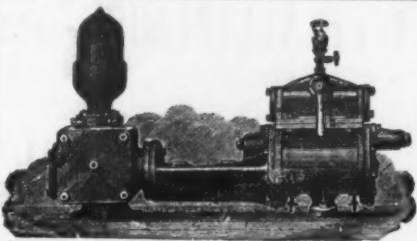
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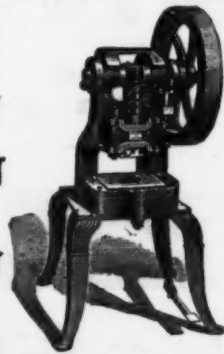
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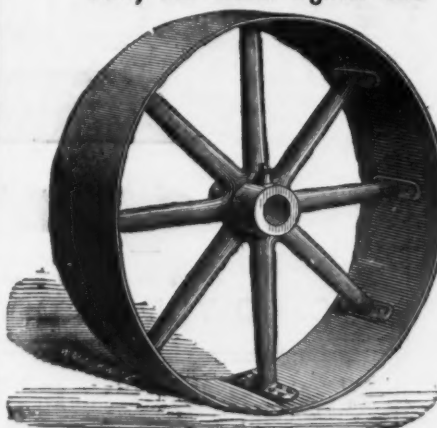
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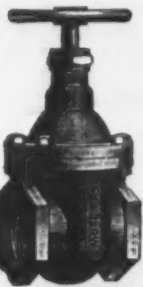
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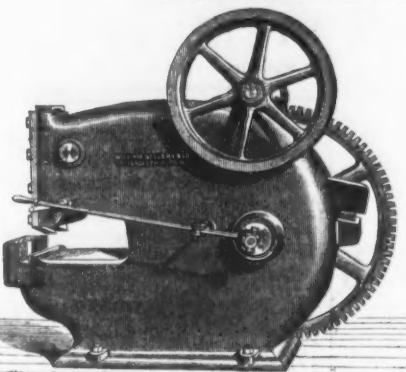
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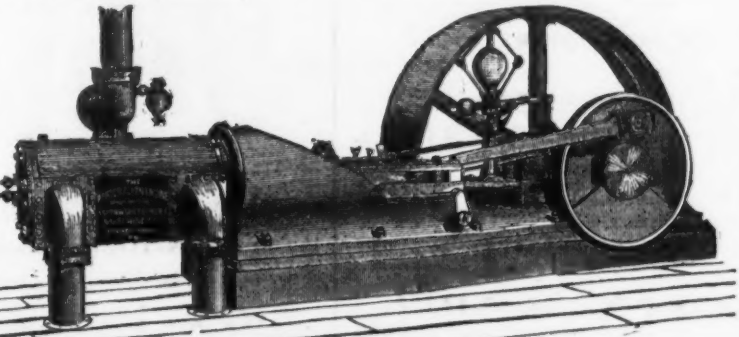
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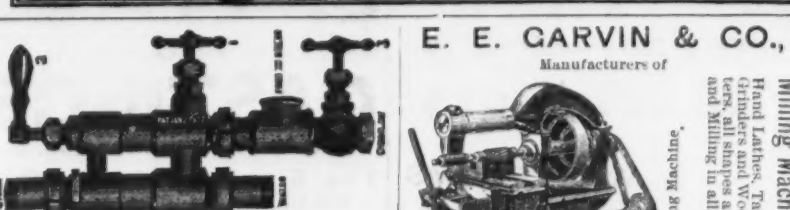
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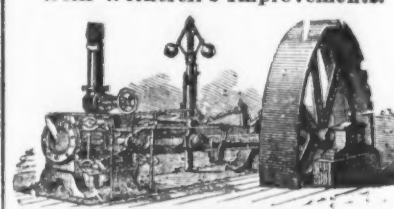
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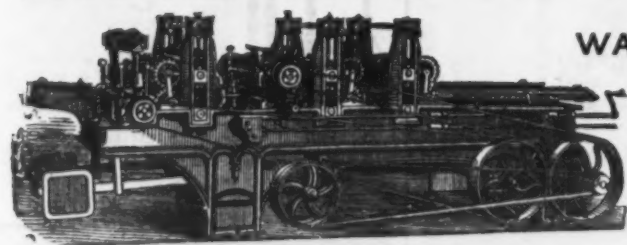
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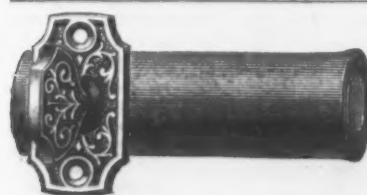
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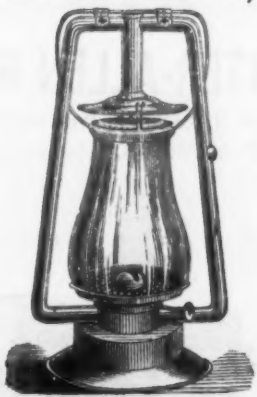
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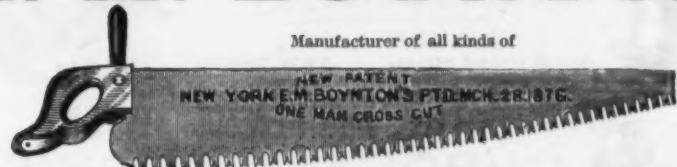
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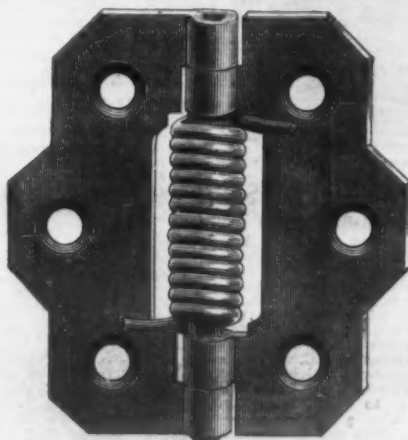
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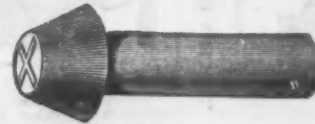
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